

***Health and Safety Plan for
the Radioactive Waste
Management Complex
Cold Test Pits for
Operable Unit 7-13/14***

*Larry R. Watson
Paul A. Sloan*

**Idaho
Completion
Project**

Bechtel BWXT Idaho, LLC

November 2003

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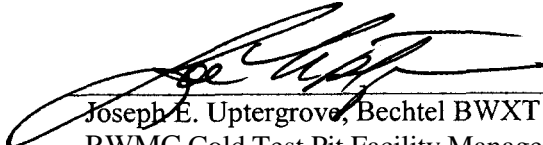
**Idaho Completion Project
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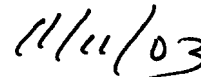
Health and Safety Plan for the Radioactive Waste Management Complex Cold Test Pits for Operable Unit 7-13/14

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Approved by



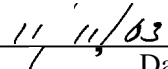
Joseph E. Uptergrove, Bechtel BWXT Idaho, LLC,
RWMC Cold Test Pit Facility Manager



Date



David M. Bright, Bechtel BWXT Idaho, LLC,
OU 7-10 Glovebox Excavator Method Project
Operations Director



Date

ABSTRACT

This health and safety plan establishes the procedures and requirements that will be used to eliminate or minimize health and safety risks to people working at the Radioactive Waste Management Complex cold (i.e., nonradioactive) test pits. The cold test pits are located in the Cold Test Pit South and the Cold Test Pit North areas, which are south and north of the Subsurface Disposal Area of the Radioactive Waste Management Complex at the Idaho National Engineering and Environmental Laboratory. This health and safety plan contains information about the hazards involved in performing work at the cold test pits, as well as the specific actions and equipment that will be used to protect people while working at the task site.

The health and safety plan is intended to give safety and health professionals the flexibility to establish and modify site safety and health procedures throughout the entire span of normal operations at the cold test pits based on the existing and anticipated hazards. The body of this health and safety plan provides the core safety and health information for the normal maintenance and operation activities for the cold test pits. Task-specific information is provided in the appendixes to this health and safety plan.

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ACRONYMS

| | |
|----------|---|
| BBWI | Bechtel BWXT Idaho, LLC |
| CFA | Central Facilities Area |
| CFR | Code of Federal Regulations |
| COCA | Consent Order and Compliance Agreement |
| CPR | cardiopulmonary resuscitation |
| CRZ | contamination reduction zone |
| CWA | controlled work area |
| dBA | decibel A-weighted |
| DOE | U.S. Department of Energy |
| DOE-ID | U.S. Department of Energy Idaho Operations Office |
| DWA | designated work area |
| EPA | U.S. Environmental Protection Agency |
| ERO | Emergency Response Organization |
| ES&H | environment, safety, and health |
| ES&H/QA | environment, safety, health, and quality assurance |
| FFA/CO | Federal Facility Agreement and Consent Order |
| FTL | field team leader |
| HASP | health and safety plan |
| HAZMAT | hazardous material |
| HAZWOPER | hazardous waste operations and emergency response |
| HEPA | high-efficiency particulate air |
| HSO | health and safety officer |
| IDLH | immediately dangerous to life or health |
| INEEL | Idaho National Engineering and Environmental Laboratory |
| ISG | in situ grouting |
| ISMS | Integrated Safety Management System |
| JSA | job safety analysis |

| | |
|-------|--|
| TE | test engineer |
| MCP | management control procedure |
| NFPA | National Fire Protection Association |
| NIOSH | National Institute of Occupational Safety and Health |
| OMP | Occupational Medical Program |
| OSHA | Occupational Safety and Health Administration |
| OTL | operations technical lead |
| OU | operable unit |
| PPE | personal protective equipment |
| PRD | program requirements document |
| RCRA | Resource Conservation and Recovery Act |
| RFP | Rocky Flats Plant |
| RI/FS | remedial investigation/feasibility study |
| RWMC | Radioactive Waste Management Complex |
| SCBA | self-contained breathing apparatus |
| SDA | Subsurface Disposal Area |
| STD | standard |
| STR | subcontract technical representative |
| SWP | safe work permit |
| TPR | technical procedure |
| TRAIN | Training Records and information Network |
| TRU | transuranic |
| TWA | time-weighted average |
| VPP | Voluntary Protection Program |
| WAG | waste area group |
| WCC | Warning Communications Center |

Health and Safety Plan for the Radioactive Waste Management Complex Cold Test Pits for Operable Unit 7-13/14

1. INTRODUCTION

1.1 Purpose

This health and safety plan (HASP) establishes the procedures and requirements that will be used to eliminate or minimize health and safety risks to people working at the Radioactive Waste Management Complex (RWMC) cold (i.e., nonradioactive) test pits. The cold test pits are located in the Cold Test Pit South and the Cold Test Pit North areas, which are south and north of the Subsurface Disposal Area of the Radioactive Waste Management Complex, respectively. This health and safety plan contains information about the hazards involved in performing work at the cold test pits, as well as the specific actions and equipment that will be used to protect people while working at the task site.

This HASP is intended to give safety and health professionals the flexibility to establish and modify site safety and health procedures throughout the entire span of normal operations at the cold test pits based on the existing and anticipated hazards. The body of this health and safety plan provides the core safety and health information for the normal maintenance and operation activities for the cold test pits. Task-specific information is provided in the appendixes to this health and safety plan. Appendix B of this HASP applies to the OU 7-10 Glovebox Excavator Method Project mockup, which will be conducted during FY 2004-2005 at Cold Test Pit South.

1.2 Scope

The work that will be performed under this HASP includes all site preparation and restoration, general housekeeping, and grounds maintenance of the cold test pits to ensure their availability as a geotechnical resource in support of the OU 7-13/14 comprehensive RI/FS.

The RWMC will be responsible for performing most phases of support work such as corrective maintenance on cold test pit support facilities and equipment, roads and ground maintenance, and transport of debris to the CFA landfill under the "Interface Agreement Between Radioactive Waste Management Complex and the Complete Balance of INEEL Cleanup" (IAG-20 2003) unless other work arrangements are made. Mobile cranes, forklifts, and other heavy equipment may be used during cold test pit operation. Appendixes to this HASP specific to tasks beyond normal cold test pit maintenance activities will be incorporated as these tasks are identified.

This HASP meets the requirements of the Occupational Safety and Health Administration (OSHA) Standard, 29 Code of Federal Regulations (CFR) 1910.120/1926.65, "Hazardous Waste Operations and Emergency Response (HAZWOPER)." The preparation of this HASP is consistent with information found in the *Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities* (NIOSH 1985), safety and health manuals for fire protection and occupational health (Manuals 14a and 14b), the Idaho National Engineering and Environmental Laboratory (INEEL) *Manual 15A—INEEL Radiological Control Manual* (PRD-183), and the INEEL Emergency Plan and Resource Conservation and Recovery Act (RCRA) Contingency Plan (PLN-114).

This HASP governs all general activities at the cold test pits that will be performed by employees of Bechtel BWXT Idaho, LLC (BBWI), the current management and operating contractor for the U.S.

Department of Energy Idaho Operations Office (NE-ID) at the INEEL; subcontractors to BBWI; and employees of other companies or U.S. Department of Energy (DOE) laboratories. The general activities include all site preparation and restoration, general housekeeping, and grounds maintenance of the cold test pits to ensure their availability as a geotechnical resource in support of the OU 7-13/14 comprehensive remedial investigation/feasibility study (RI/FS). Operable Unit 7-13/14 is the comprehensive OU for Waste Area Group 7, which comprises the RWMC. People not normally assigned to work at the site such as representatives of DOE, the State of Idaho, OSHA, and the U.S. Environmental Protection Agency (EPA) will be considered nonworkers who fall under the definition of “occasional site workers,” as stated in the OSHA HAZWOPER standard (29 CFR 1910.120 and 1926.65).

This plan will be reviewed and revised by the health and safety officer (HSO) in conjunction with the field team leader and necessary environmental, safety, and health professionals, the Idaho Completion Project (ICP) Environment, Safety, and Health and Quality Assurance (ESH&QA) manager, or designee, to ensure the effectiveness and suitability of this HASP.

1.3 Additional Activities

Other work activities that may be performed prior to or during the performance of cold test pit project-specific activities include the following, as applicable:

- Prepare and obtain approval of National Environmental Policy Act documentation
- Prepare and establish hazard categorization determination
- Perform a Davis-Bacon determination
- Prepare and complete characterization sampling and analysis plan
- Prepare and initiate Integrated Safety Management System (ISMS) work controls, integrated planning sheets, job safety analyses, safe work permits, and other permits
- Prepare waste documentation
- Prepare and obtain approval of the Storm Water Prevention Plan, as necessary
- Prepare industrial hygiene exposure assessment
- Perform project- and site-specific crew training
- Mobilize equipment to project site
- Arrange for temporary power and telephone, as necessary
- Ensure that work site isolation and barriers are established
- Perform job site cleanup.

a. **NE-ID** signifies that the DOE Idaho Operations Office reports to DOE’s Office of Nuclear Energy, Science, and Technology (NE).

1.4 Idaho National Engineering and Environmental Laboratory Site Description

The INEEL is located in the northwestern portion of the Eastern Idaho Snake River Plain in southeast Idaho, located approximately 58 km (36 mi) west of Idaho Falls, Idaho (see Figure 1), and encompasses 2,305 km² (890 mi²).

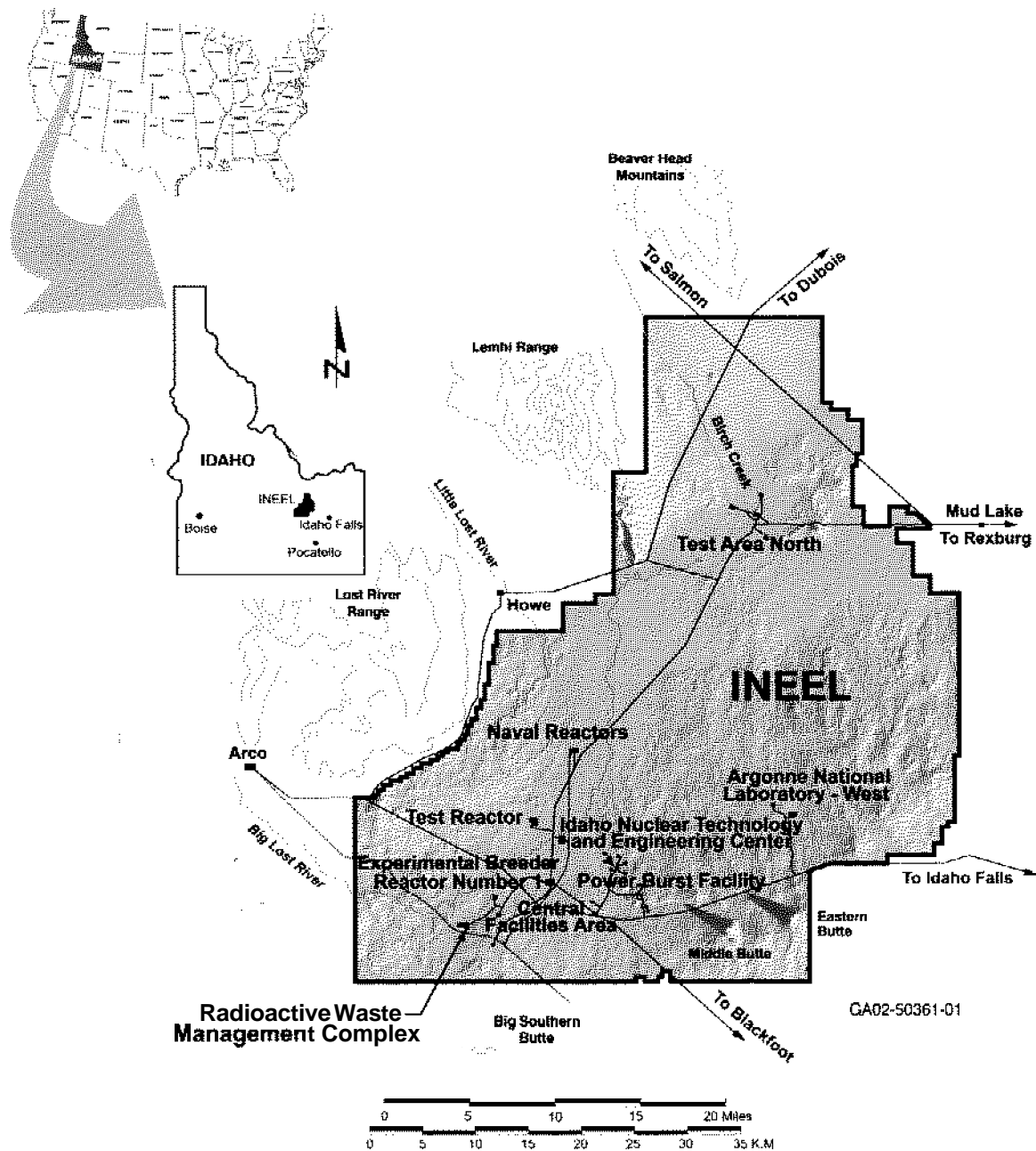


Figure 1. Map of Idaho National Engineering and Environmental Laboratory Site showing the location of the Radioactive Waste Management Complex.

The U.S. Atomic Energy Commission (now DOE) established the INEEL (originally called the National Reactor Testing Station) in 1949 as a site for building and testing a variety of nuclear facilities. The INEEL also has been the storage facility for transuranic (TRU) radionuclides and low-level radioactive waste since 1952. The INEEL currently supports the engineering and operations efforts of DOE and other federal agencies in areas of nuclear safety research, reactor development, reactor operations and training, nuclear defense materials production, waste management technology development, and energy technology and conservation programs. The responsibility for the INEEL rests with DOE, which also designates authority to government contractors to operate the INEEL. The current primary contractor for DOE-ID at the INEEL, BBWI, provides management and operating services to the majority of INEEL facilities.

In 1987, the *Consent Order and Compliance Agreement* (COCA) (DOE-ID 1987) was entered into between DOE and the EPA in accordance with the RCRA (42 USC § 6901 et seq., Section 3008[h]). The COCA required DOE to conduct an initial assessment and screening of all solid waste and hazardous waste disposal units at the INEEL and set up a process to conduct any necessary corrective actions. On July 14, 1989, the INEEL was proposed for listing on the National Priorities List (54 FR 29820). The listing was proposed by the EPA under the authorities granted to the EPA by the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended by the Superfund Amendments and Reauthorization Act of 1986 (42 USC § 9601 et seq.). The final rule that listed the INEEL on the National Priorities List was published on November 21, 1989 (54 FR 48184). As a result of having the INEEL on the National Priorities List, DOE, the State of Idaho and the EPA entered into the Federal Facility Agreement and Consent Order (FFA/CO) on December 9, 1991 (DOE-ID 1991). Under the FFA/CO, the INEEL was divided into 10 waste area groups (WAGs) further subdivided into OUs. The RWMC was designated as WAG 7 with 14 OUs. Operable Unit 7-13/14 combines the scope and schedule for the OU 7-13 TRU pits and trenches and the OU 7-14 comprehensive RI/FS.

1.5 Site Description

1.5.1 Radioactive Waste Management Complex and Subsurface Disposal Area Description

The RWMC is located in the southwestern portion of the INEEL, as shown in Figure 1. This area was established in the early 1950s as a disposal site for solid, low-level waste generated by INEEL operations. Within the RWMC is the Subsurface Disposal Area (SDA) (35.6 ha [88 acres]) where radioactive waste materials have been buried in underground pits, trenches, soil vault rows, one aboveground pad (Pad A), and the Transuranic Storage Area where interim storage TRU waste is in containers on asphalt pads. The TRU waste was disposed of in the SDA from 1954 to 1970. Rocky Flats Plant (RFP) TRU waste was received for disposal in the SDA from 1954 through 1970 (EG&G 1985). The RFP is a DOE-owned facility in Colorado^b and was used primarily for the production of components for nuclear weapons.

In 1969, the U.S. Geological Survey began a study to determine the potential for radionuclide migration from the SDA buried waste (EG&G 1985), and contaminant migration studies are ongoing. Analytical results indicate that minute amounts of anthropic radionuclides may have migrated from the SDA toward the Snake River Plain Aquifer. The major studies used to develop the RI/FS rationale for WAG 7 are summarized in the *Work Plan for Operable Unit 7-13/14 Waste Area Group 7*

b. The Rocky Flats Plant is located 26 km (16 mi) northwest of Denver. In the mid-1990s, it was renamed the Rocky Flats Environmental Technology site. In the late 1990s, it was again renamed, to its present name, the Rocky Flats Plant Closure Project.

Comprehensive Remedial Investigation/Feasibility Study (Becker et al. 1996). Historical investigations are also referenced and summarized in the *Interim Risk Assessment and Contaminant Screening for the Waste Area Group 7 Remedial Investigation* (Becker et al. 1998). The remedial investigation report for the OU 7-13/14 RI/FS (Holdren et al. 2002) provides up-to-date summaries of historical investigations conducted at the RWMC.

The RWMC is located on the Snake River Plain in the gently rolling semiarid desert of southeastern Idaho. Surface topography of the region is determined by young basalt lava flows and associated volcanic features (e.g., cinder cones, vents, pressure ridges, and collapsed lava tubes). Average annual precipitation is 22 cm (8.7 in.). The depth-to-watertable at the SDA is about 177 m (580 ft) (Becker et al. 1998).

Soil is shallow in the cold test pit areas (9 m [30 ft] maximum depth to basalt) and is composed of clay, silt, and sand. Soil mineralogy is predominately clay minerals (50 wt%), quartz (37.5 wt%), calcite (10 wt%), and iron oxyhydroxide and other minerals (2.5 wt%). Soil-moisture pH is alkaline (about 8 ± 0.5). The soil pH is buffered by the calcite-water-to- CO_2 interactions and by oxygen in the air. The soil moisture is saturated with respect to calcite, super-saturated with dolomite (Wood and Norrell 1996), iron minerals, and other soil minerals. Caliche, very common in the SDA, is a hard, impermeable, concrete-like soil naturally cemented by calcite.

The bedrock is a series of generally horizontal basalt lava flows separated by thin, discontinuous sedimentary interbeds. Consequently, the overall structure is analogous to a layer cake. The morphology of the basalt flows is highly variable from dense, massive material to vesicular and highly fractured rock. Lava tubes are common. The interbeds are primarily unconsolidated sediments, cinders, and volcanic breccia. Air permeability measurements (EDF ER-VVED-101, 1992) indicate that the permeability varies through five orders of magnitude, from virtually infinite permeability to 0.05 darcy. Measurements of natural air-pressure fluctuation and attenuation, as a function of depth, indicate that the air permeability of the basaltic material sharply decreases at some depth between 22 and 32 m (72 and 105 ft) below ground surface. The material at depths less than 22 m (72 ft) is homogeneous in terms of air permeability, which also is the case for material below 32 m (105 ft).

1.5.2 Cold Test Pit Area Description

The cold test pits were constructed as nonhazardous, nonradioactive simulated waste pit areas and are used to demonstrate characterization, retrieval, and treatment technologies that may be useful for the remediation of buried waste. The simulated waste pits provide known targets and waste forms for accurate evaluation and calibration of procedures, technologies, and equipment. The mission for the cold test pits is to identify, evaluate, and demonstrate various innovative technologies for the remediation of radioactive and hazardous waste buried throughout the DOE complex. The pits were constructed in areas free of hazardous materials and radiological contaminants with soil characteristics and depths similar to the design and construction features of TRU waste pits and trenches located in the SDA.

Various temporary support structures including support trailers, wooden storage sheds, soft-sided tents (yurts), and cargo containers are used to support project activities. Minimal utilities are available at the cold test pits. Drinking water is supplied to support trailers by bottles or coolers. Chemical toilets are provided and serviced through a local contractor. Some areas within the cold test pit sites are supplied with power. When remote areas within the cold test pit boundaries require power, it is provided through the use of generators obtained and serviced through the Central Facilities Area (CFA) equipment pool. The locations of the two cold test pit areas near the SDA are shown in Figure 2.

1.5.2.1 Cold Test Pit South. Cold Test Pit South was established in 1988 and has been used for many treatability studies such as for in situ grouting (Loomis, Jessmore, and Weidner 2001). The area is located 183 m (200 yd) south of the RWMC boundary. Storage tanks, waste boxes, cardboard drums, and

concrete culverts have been used as containers for simulated waste. Some containers from past studies remain buried there. A majority of the Cold Test Pit South area is open ground and covers approximately 4 ha (10 acres). Cold Test Pit South facilities, roads, and fences are shown in Figure 3.

1.5.2.2 Cold Test Pit North. The Cold Test Pit North area was established in 1999. It is the former site of the portable concrete batch plant for the Pit 9 technology demonstration activity conducted by Lockheed Martin Advanced Environmental Systems. This site is immediately west of the Pit 9 administration area (see Figure 2). The Cold Test Pit North facilities, roads, and fences are illustrated in Figure 4. Three-phase electrical power is available from the RWMC 12.5-kVA loop. Currently, the pit contains one test cell that was constructed to support the OU 7-13/14 in situ vitrification project (Farnsworth et al. 1999). Another cell, which has since been excavated and restored, was used to conduct the dynamic disruption test in 2001 (Shaw 2001). The cell used for the dynamic disruption test was located south of the existing cell.

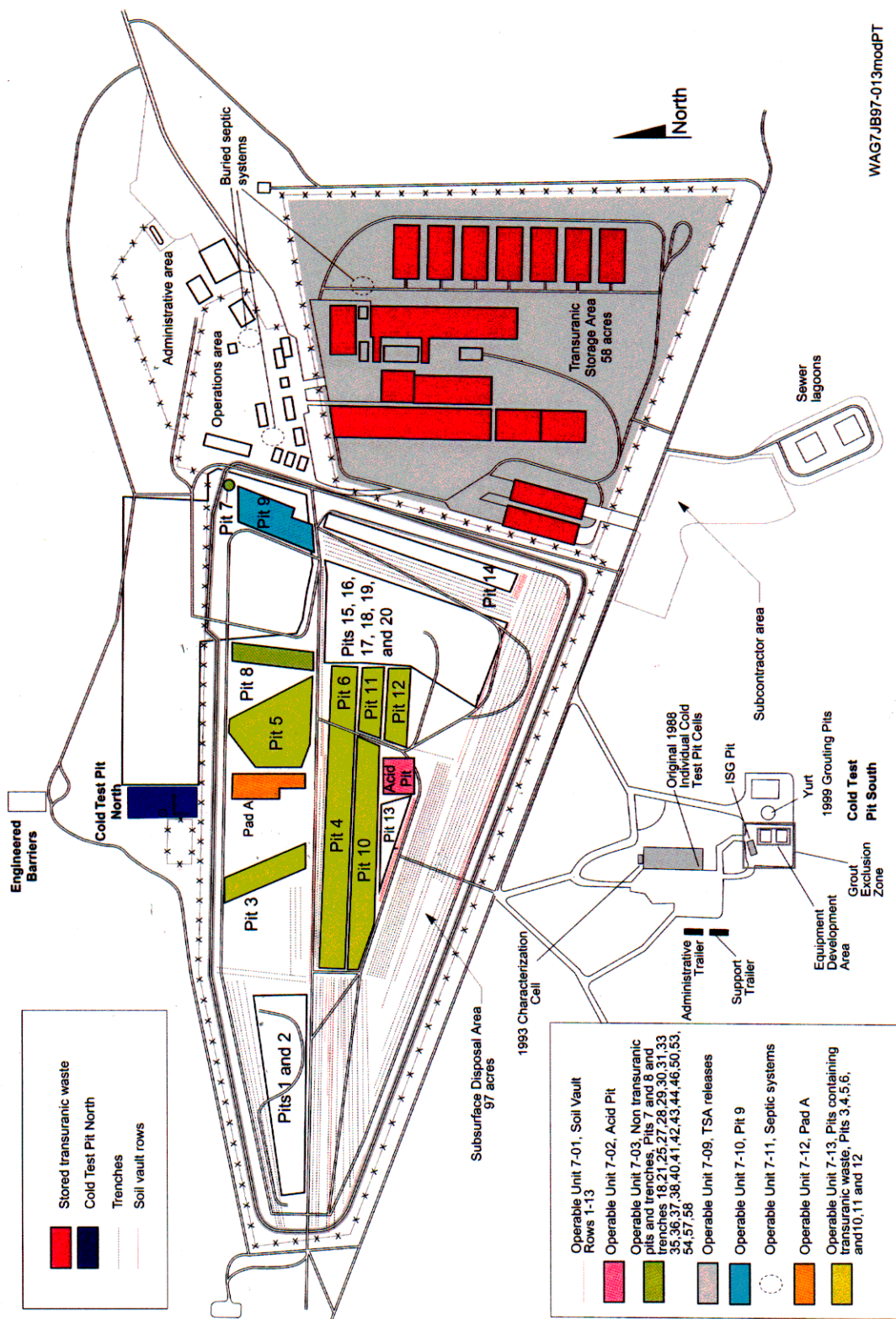
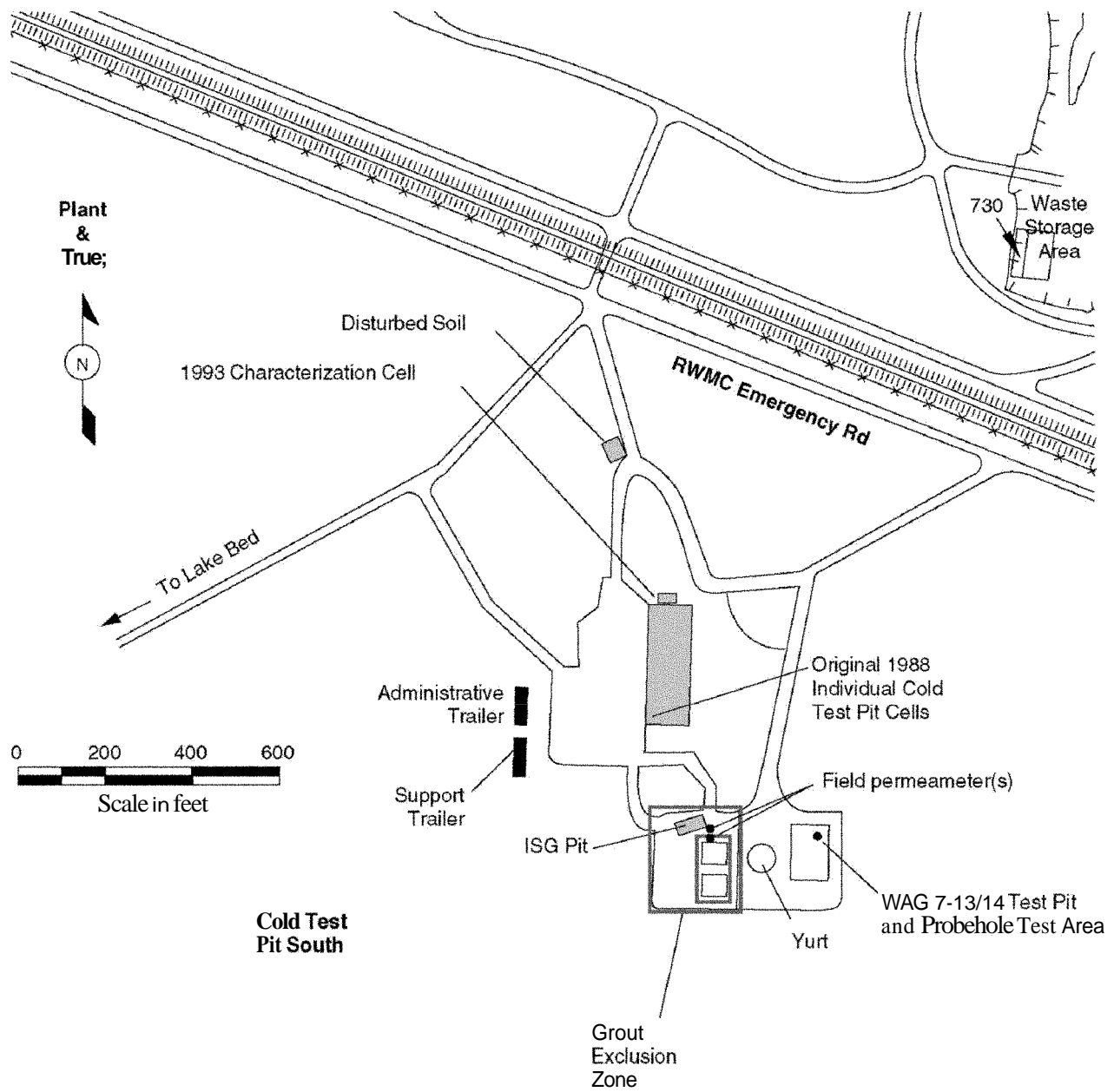


Figure 2. Map of the Radioactive Waste Management Complex showing the Subsurface Disposal Area, Cold Test Pit North, and Cold Test Pit South.



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Figure 3. Map of Cold Test Pit South showing facilities, roads, and fences

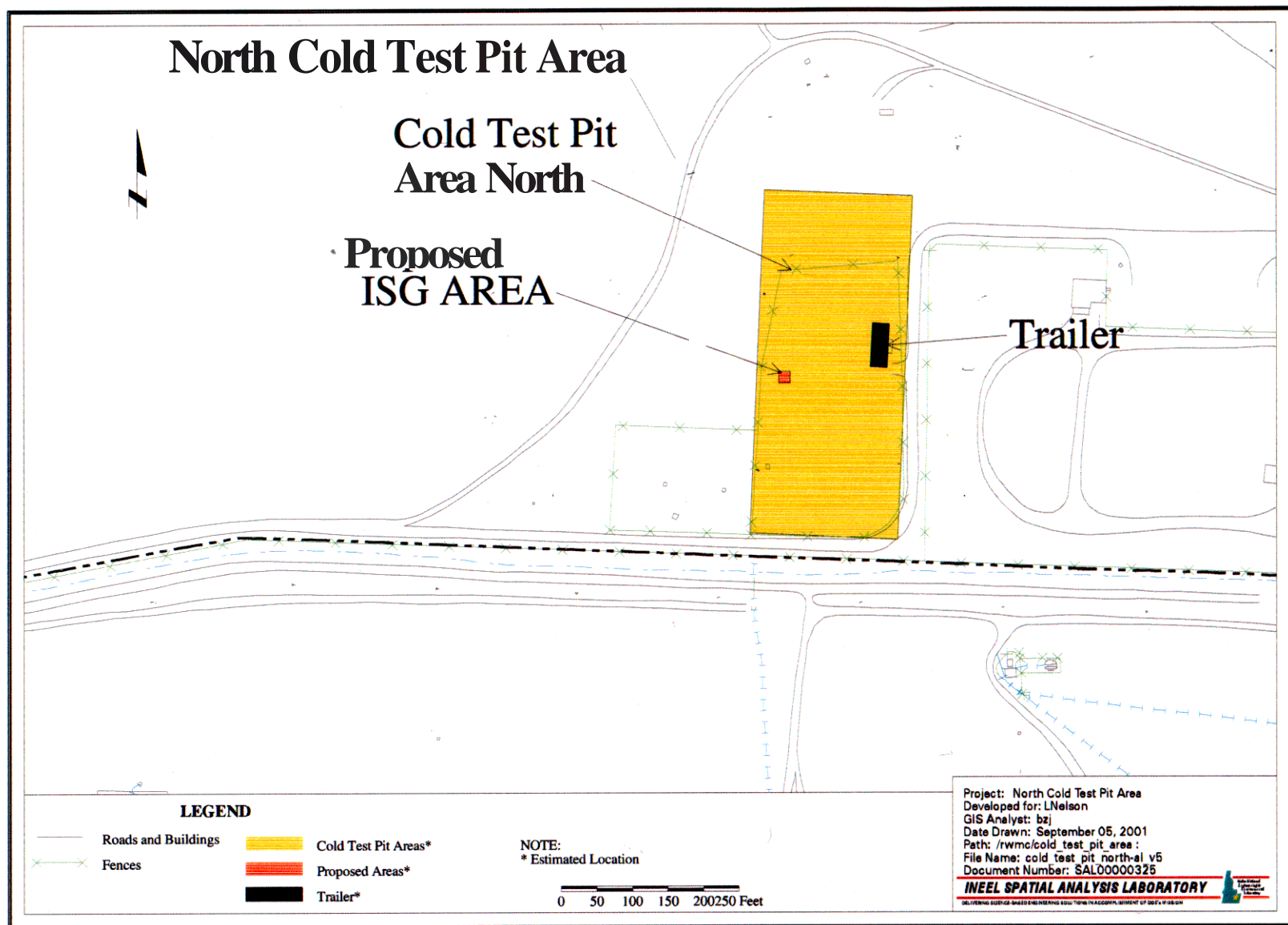


Figure 4. Map of the Cold Test Pit North showing facilities, roads, and fences.

2. KEY SITE PERSONNEL RESPONSIBILITIES

The organizational structure for this project reflects the resources and expertise required to perform the work while minimizing risks to worker health and safety, the environment, and the general public. The key roles at the task site and lines of responsibility and communication are shown on the organizational chart in Figure 5. Construction activities conducted at the task site will be under the direct authority and control of construction management personnel. Normal task site maintenance operations and project testing will be under the direct authority and control of ICP field operations personnel. Appendixes identifying project specific organizational requirements beyond normal cold test pits construction, maintenance and test activities will be added to this HASP as they are identified. The following sections outline the responsibilities of key site personnel.

Task-site responsibilities included in this section may not be represented on all projects. Only those positions actually assigned to a given project will be represented for the project. Those positions defined and not represented on the project will be for reference only.

2.1 Project Managers and Leads

Each specific project manager and lead is responsible for coordinating all document preparation and field, laboratory, and modeling activities. The specific project managers are responsible for the overall work scope, schedule, and budget of their projects. The specific project managers also are responsible for ensuring that Form 340.02, "Employee Job Function Evaluation," is (1) completed for all project employees, (2) reviewed by the project industrial hygienist for validation, and (3) submitted to the Occupational Medical Program (OMP) for determination of whether a medical evaluation is necessary. Each specific project manager ensures that all documentation (including logbook entries) is completed and submitted to ICP Document Control at the completion of the project. Each specific project manager may use project technical support personnel to aid in coordination of field activities under the authority and supervision of site control personnel (field team leader [FTL], subcontract technical representative [STR], or Project Designee).

2.2 Long-Term Stewardship Operations Supervisor

The Long-Term Stewardship operations supervisor serves as the principal point of contact for the identification of resources to ensure the successful completion of maintenance, support, and project-specific activities.

2.3 Construction Coordinator

The construction coordinator is responsible for providing key information and decisions during project planning and designs concerning constructability issues and overall construction management and contracting strategies. The construction coordinator has primary responsibility for managing the construction phase of projects from design completion to construction closeout. Other responsibilities include the following:

- Managing progress on work packages for cost, schedule, and technical performance for the construction phase of the project
- Serving as point of contact for all safety issues

- Resolving claims and negotiating change orders (with appropriate input from the project manager, design team leader, purchasing, and the inspectors)
- Reviewing and monitoring the construction contractor schedule and overall performance and enforcing applicable contract requirements
- Coordinating dispute resolution between the contractor and BBWI.

2.4 Subcontract Technical Representative

The STR coordinates field activities at the cold test pits on behalf of the construction management organization. Health and safety issues must be brought to the attention of the STR. Specific responsibilities include the following:

- Enforce task-site control, document activities, and conduct project-specific plan-of-the-day and daily safety briefings at the start of each shift.
- Complete briefings and reviews in accordance with the requirements outlined in Management Control Procedure (MCP) -3003, “Performing Pre-Job Briefings and Documenting Feedback.” The STR will complete the job requirements checklist in accordance with Standard (STD) -101, “Integrated Work Control Process.”
- Review and approve contractor invoices.
- Resolve claims and negotiate change orders (with appropriate input from the project manager, construction coordinator, design team leader, purchasing, and the inspectors).
- Enforcing terms and conditions of contracts.
- Enforce and coordinate environmental, safety, and health (ES&H) requirements and activities, and oversee compliance with the BBWI *Subcontractor Requirements Manual*.
- Manage emergency and accident response and coordination.
- Conduct ESH&QA inspections.
- Perform contract closeout.
- Coordinate and administer contract warranty issues.
- Participate in quality assurance reviews during design for construction feasibility issues.

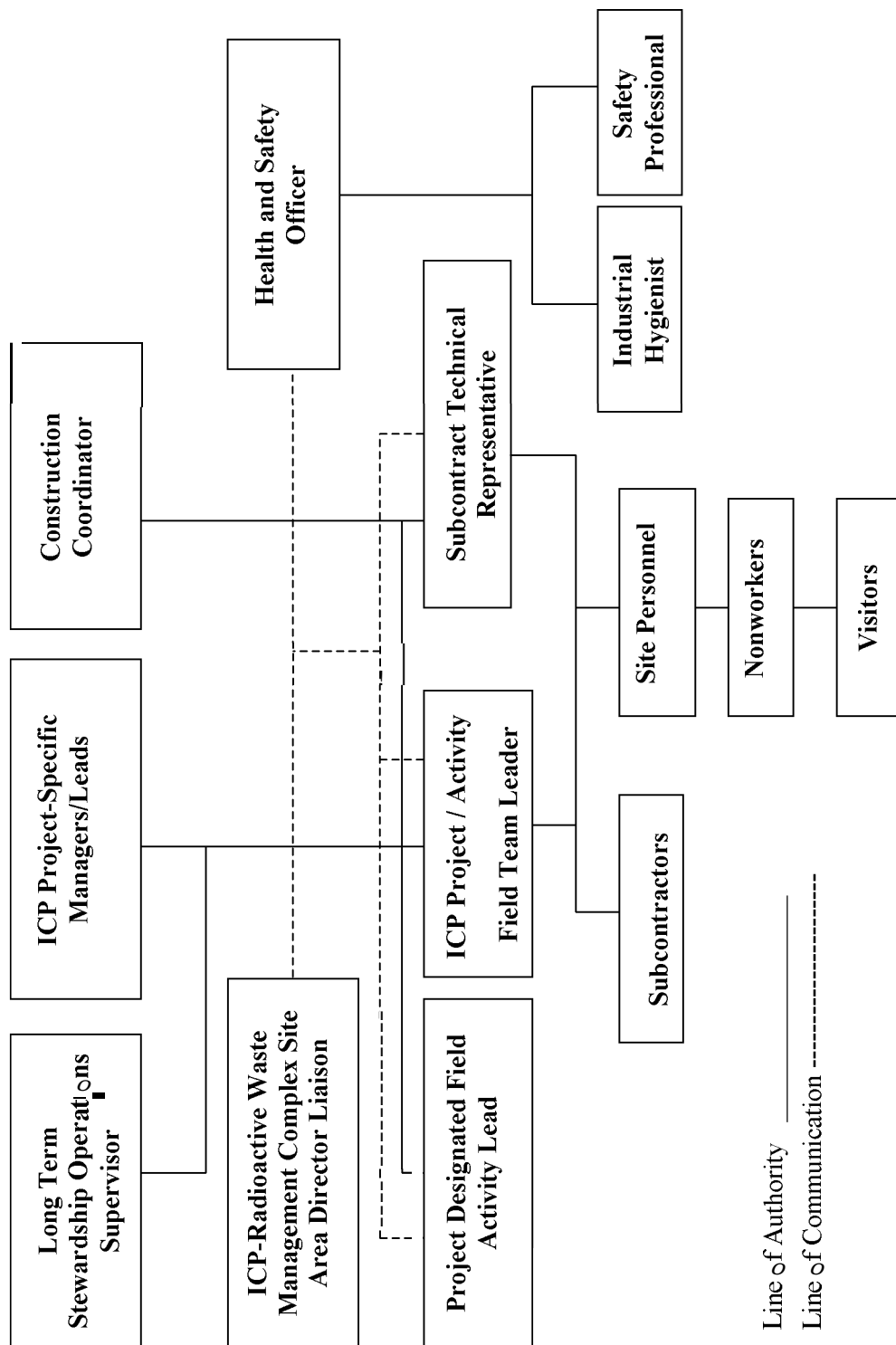


Figure 5. Operable Unit 7-13/14 Radioactive Waste Management Complex cold test pits organization chart.

2.5 Field Team Leader

The FTL coordinates normal task site maintenance and project field testing activities at the cold test pits on behalf of ICP project-specific managers and leads. Health and safety issues must be brought to the attention of the field team leader. Specific responsibilities include the following:

- Enforce task-site control, document activities, and conduct project-specific plan-of-the-day and daily safety briefings at the start of each shift.
- Complete briefings and reviews in accordance with the requirements outlined in MCP-3003, “Performing Pre-Job Briefings and Documenting Feedback.” The FTL will complete the job requirements checklist in accordance with Standard-101, “Integrated Work Control Process.”
- Manage emergency and accident response and coordination.
- Conduct ESH&QA inspections.
- Ensure compliance with waste management requirements and coordinate such activities with the environmental compliance coordinator or designee.

2.6 Project Designated Field Activity Lead

The project designated field activities lead coordinates project specific activities at the cold test pit when support by a field team leader or subcontract technical representative is not applicable. The project designee will direct project specific field activities at the cold test pits on behalf of ICP project-specific managers as required. Health and safety issues must be brought to the attention of the project designee when utilized by ICP management. Specific responsibilities include the following:

- Enforce task-site control, document activities, and conduct project-specific plan-of-the-day and daily safety briefings at the start of each shift.
- Complete briefings and reviews in accordance with the requirements outlined in MCP-3003, “Performing Pre-Job Briefings and Documenting Feedback.” The project designee will complete the job requirements checklist in accordance with STD-101, “Integrated Work Control Process,” when applicable.
- Manage project site emergency and accident response and coordination.
- Conduct project ESH&QA inspections
- Ensure compliance with waste management requirements and coordinate such activities with the environmental compliance coordinator or designee.

2.7 Radioactive Waste Management Complex Site Area Director Liaison

The ICP and RWMC site area director liaison serves as the point of contact for coordination between ICP and the RWMC site area director on project-specific issues, as appropriate. The RWMC liaison provides advance notice to the site area director or designee of (1) scheduled activities including documents requiring RWMC review or approvals that impact site area operations and (2) site area operations that impact ICP project activities.

2.8 Health and Safety Officer

The HSO serves as the primary point of contact for health and safety issues. The HSO is responsible for advising the field team leader, subcontract technical representative, or project designee on all aspects of health and safety and will be authorized to stop work at the site if any operation threatens worker or public health or safety. The HSO may be assigned other responsibilities, as stated in other sections of this HASP (see, for example, Sections 4.3, 5.1, and 7.2), as long as those other responsibilities do not interfere with the primary responsibilities of the HSO. The HSO will be authorized to verify compliance with this HASP; conduct inspections; require and monitor corrective actions; monitor decontamination procedures, if required; and require corrections, as appropriate. Environment, safety, and health professionals at the site support the HSO (e.g., the safety engineer, industrial hygienist, radiological control technician, radiological engineer, environmental coordinator, and facility representative), as necessary.

Individuals assigned as the HSO or alternate HSO must be qualified (in accordance with the OSHA definition) to recognize and evaluate hazards and will be given the authority to take or direct actions to ensure that workers are protected. While the HSO also may act as the industrial hygienist, safety engineer, or in some cases the field team leader or subcontract technical representative,^d additional site responsibilities requested of the HSO must not conflict^d with the role of the HSO at the site.

If it is necessary for the HSO to leave the site, an alternate individual (e.g., field team leader, subcontract technical representative, or other knowledgeable person) will be appointed by the HSO to fulfill this role. The identity of the acting HSO will be recorded in the appropriate logbook and site personnel will be notified.

2.9 Environmental Compliance Coordinator

The assigned ICP environmental compliance coordinator is responsible for overseeing, monitoring, and advising the field team leader and subcontract technical representative who are performing task-site activities on environmental issues and concerns by ensuring compliance with DOE orders, EPA regulations, and other regulations concerning the effects of task-site activities on the environment. The ICP environmental compliance coordinator provides support surveillance services for hazardous waste storage and transport, waste disposal, and surface water and storm water run-off control. The ICP environmental compliance coordinator must assist the field team leader, subcontract technical representative, or project designee in completing the job requirements checklist.

2.10 Task-Site Personnel

All task-site personnel, including ICP and subcontractor personnel, must comply with the requirements of this HASP. The field team leader, subcontract technical representative, or project designee will brief project-specific personnel at the start of each working shift. During the prejob briefing, the following will be discussed: (1) all daily tasks, (2) associated hazards, (3) engineering and administrative controls, (4) required personal protective equipment (PPE), (5) work control documents, and (6) emergency conditions and actions. Input from the project HSO, industrial hygienist, and

c. The specific duties depend on the hazards, complexity, and size of the activity involved, and required concurrence from the Environmental Restoration Environment, Safety, Health and Quality Assurance manager.

d. Additional responsibilities cannot conflict with the primary responsibilities of the health and safety officer, either philosophically or in terms of significant added volume of work.

radiological control personnel will be provided to clarify task health and safety requirements. All personnel will be encouraged to ask questions about site tasks and provide suggestions on ways to perform required tasks in a more safe and effective manner based on lessons learned from previous activities.

Once at the site, personnel will be responsible for identifying and reporting any potentially unsafe situations or conditions to the field team leader, subcontract technical representative, project designee, or the HSO for corrective action. If it is perceived that an unsafe condition poses an imminent danger, personnel will be authorized to stop work immediately and then notify the field team leader, subcontract technical representative, project designee, or the HSO of the unsafe condition.

2.11 Nonworkers

All people who may be on the site but are not part of the field team will be considered nonworkers for the purposes of this project (e.g., observers, administrative managers, guests, and other personnel not assigned to the project). Personnel will be considered “onsite” when they are present in or beyond the designated control zone. Nonworkers are deemed “occasional site workers” in accordance with the OSHA HAZWOPER standard (29 CFR 1910.120 and 1926.65) and must meet minimum training requirements for such workers and any additional site-specific training identified in Section 4. If the nature of a nonworker’s task requires work within the control zone, then that nonworker must meet all the same training requirements as other field team members. A site representative must accompany all nonworkers until they have completed their 24-hour supervised field experience training.

2.12 Visitors

All visitors with official business at the task site, including ICP personnel, representatives of DOE, and state or federal regulatory agencies, may not proceed beyond the control zone boundary without receiving project-specific HASP training. They must also sign the HASP training acknowledgment form, receive a safety briefing, wear appropriate PPE, and provide proof of meeting all training requirements, as specified in Section 4.

A fully trained site representative will escort visitors (e.g., field team leader, subcontract technical representative, HSO, or a qualified designated alternate) at all times while on the site.

A casual visitor to the site is a person who does not have a specific task to perform or other official business to conduct at the site. Casual visitors will not be permitted on the site.

2.13 Industrial Hygienist

The assigned industrial hygienist is the primary source for information for nonradiological, hazardous, and toxic agents at the site. The industrial hygienist is responsible for assessing the potential for worker exposures to hazardous agents in accordance with the companywide safety and health manuals, MCPs, and accepted industry industrial hygienist practices and protocol. During participation in site characterization activities, the industrial hygienist is responsible for performing the following activities:

- Assessing and recommending appropriate hazard controls for the protection of task-site personnel
- Operating and maintaining airborne sampling and monitoring equipment

- Reviewing PPE for effectiveness
- Assessing and recommending the use of PPE required in this HASP
- Recommending changes to PPE requirements, as appropriate.

The industrial hygienist also must review all relevant employee job function evaluation forms (Form 340.02, “Employee Job Function Evaluation”) to validate management’s completion of the form. After validation, the form will be sent to the OMP for scheduling of a medical evaluation, as needed.

Following an evacuation, the industrial hygienist in conjunction with other recovery team members will assist the field team leader, subcontract technical representative, or project designee in determining whether conditions exist for safe site reentry. Personnel showing health effects (e.g., signs and symptoms) resulting from possible exposure to hazardous agents will be referred to an OMP physician by the industrial hygienist, the industrial hygienist’s supervisor, or the HSO. The industrial hygienist may have other duties at the site as specified in other sections of this HASP, in program requirements documents (PRDs), or in MCPs. During emergencies involving hazardous materials (HAZMATs), airborne sampling and monitoring results will be coordinated with members of the Emergency Response Organization (ERO).

2.14 Safety Professional

The assigned safety engineer will review work packages; observe task-site activity; assess compliance with the safety and health manuals for fire protection and occupational health (Manuals 14a and 14b); coordinate with other ES&H disciplines as required; sign safe work permits (SWPs); advise the field team leader, subcontract technical representative, or project designee on required safety equipment; answer questions on safety issues and concerns; and recommend solutions to safety issues and concerns that arise at the site. The safety engineer may have other duties at the site, as specified in other sections of the HASP or in PRDs and MCPs.

3. RECORD-KEEPING REQUIREMENTS

Idaho Completion Project Document Control is required to organize and maintain data and reports generated by ICP field activities. Document Control maintains a supply of all controlled documents and provides a documented system for the control and release of controlled documents, reports, and records. Document Control maintains copies of the project plans for ICP, this HASP, the “Environmental Restoration Project Management Plan” (PLN-694), the *Quality Assurance Project Plan* (DOE-ID 2003), and other project-specific documents in the project file. All other project records and logbooks, except industrial hygiene logbooks, must be forwarded to Administrative Record and Document Control within 30 days after completion of field activities.

3.1 Industrial Hygiene Monitoring Records

The industrial hygienist must record airborne monitoring and sampling data (both area and personal) on the industrial hygiene system. All monitoring and sampling equipment will be maintained and calibrated in accordance with ICP procedures and the manufacturer’s specifications. Industrial hygiene airborne monitoring and sampling data will be treated as limited access information and will be maintained by the industrial hygienist in accordance with companywide safety and health manual procedures. Any airborne monitoring or sampling done by nonindustrial hygiene and safety personnel will be documented in a project-controlled logbook, which will be reviewed by the industrial hygienist.

Task-site personnel or their representatives have a right to both industrial hygiene monitoring and sampling (both area and personal) data.

3.2 Documentation of Field Activities and Site Attendance

Documentation of field construction activities under the direction of the STR will be maintained on Form 540.23, “Subcontractor Daily Report.” Documentation of cold test pit maintenance and field test activities under the direction of the FTL or project designee will be maintained in accordance with MCP-1194, “Logbooks for ER and D&D&D Projects.” The field team leader will keep a record of daily project-specific events in the field team leader logbook. An assigned project designee will keep a record of daily project-specific events in appropriate logbooks as required above.

Site attendance will be documented at the cold test pits for all activities and will contain an accurate record of all personnel (e.g., workers and nonworkers) who are onsite each day.

Project activities at cold test pit areas will maintain project-specific site attendance logbooks as well as logbooks for documentation of field activities. When project-specific logbooks are in effect, project-specific personnel will not be required to sign in on the general cold test pit maintenance and operations site attendance logbook.

Logbooks must be obtained from ICP Document Control. Completed logbooks are submitted to ICP Document Control, along with other project-specific documents at project completion.

4. PERSONNEL TRAINING

All work-site personnel will receive training as specified by 29 CFR 1910.120 and 1926.65 and the safety and health manuals. Table 1 provides a summary of training requirements for task-site personnel for normal cold test pit work. Specific training requirements for each worker may vary depending on the hazards associated with their project-specific job assignment. Appendixes will be added to this HASP as project-specific tasks (beyond normal cold test pit maintenance activities) are identified.

4.1 General Training

Proof that all required training has been completed (including applicable refresher training) must be maintained at the site or made available electronically. Examples of acceptable written training documents include the “40-hour or 24-hour OSHA HAZWOPER Card,” “Respirator Authorization Card,” “Medic/First-Aid Training Card,” and a copy of an individual’s or department’s Training Records and Information Network (TRAIN) printout demonstrating completion of training. For subcontractors, a copy of a certificate and card issued by the institution where the site-specific required training was received also is acceptable proof of training.

4.2 Site-Specific Project Training

Before beginning work at the task site, project site-specific training will be conducted by the field team leader, subcontract technical representative, or designee. This training will consist of a complete review of this HASP and attachments, job safety analysis, SWPs, and other applicable work control documents. Each training session will include time for discussion and questions. At the time of training, personnel training records will be checked and verified to be current and complete for all required training shown in Table 1. Upon completing project site-specific training, personnel will either sign Form 361.25, “Group Read & Sign Training Form,” or complete computer-based training indicating that they have received this training, understand the project tasks, associated hazards and mitigation, and agree to follow the OU 7-13/14 HASP and all other applicable work control and safety requirements.

For tasks requiring HAZWOPER training, the HSO, field team leader, subcontract technical representative, or project designee will monitor each newly 40-hour trained worker’s performance to meet the requirement for 24 hours of supervised field experience in accordance with 29 CFR 1910.120(e) and 29 CFR 1926.65(e). Form 361.47, “Hazardous Waste Operations (Hazwoper) Supervised Field Experience Verification 29 CFR 1910.120” will be completed. This will satisfy the HAZWOPER initial 24-hour supervised field experience. For the 24-hour trained HAZWOPER workers, the same procedure will be followed except the supervised field experience will last only 8 hours.

The training records will be forwarded to the ICP training coordinator at Mail Stop 3915 and the RWMC training coordinator (as applicable) for retention in the employee system (TRAIN).

4.3 Daily Plan-of-the-Day Briefing and Lessons Learned

The HSO, field team leader, subcontract technical representative, or project designee, as applicable, will conduct a daily plan-of-the-day safety briefing when work is scheduled at the cold test pits. During this briefing, daily tasks will be outlined, hazards identified, hazard controls and work zones established, PPE requirements discussed, and employees’ questions answered. At the completion of this briefing, work control documents will be read and signed such as work orders, all SWPs, and all job safety analyses. Particular emphasis will be placed on lessons learned from the activities of the previous day and how tasks can be completed in the safest, most efficient manner. All personnel will be asked to contribute ideas to enhance worker safety and mitigate potential exposures at the project task site.

Table 1. Required training for site personnel.

| Training | Field Team Leader, Subcontract Technical Representative, Health and Safety Officer | Field Team (Required) | Nonworkers ^a (Required) | Visitors ^b (Required) |
|---|---|-----------------------------|---------------------------------------|-------------------------------------|
| Site-specific training | X | X | X ^d | X ^d |
| Hazard communication" | X | X | X | X |
| Fire extinguisher training | X | — | — | — |
| Site control and warning devices" | X | X | X | X |
| HASP emergency response plan (see Section 11)" | X | X | X | X |
| Cardiopulmonary resuscitation and medic first aid ^h | X | — | — | — |

a. Nonworkers (occasional site workers) who must enter the control zone to perform work are required to have training necessary to perform their assigned tasks.

b. Visitors are required to meet the nonworker training requirements, at a minimum, if they enter the control zone.

d. A site hazard overview briefing may be performed instead of site specific training if nonworkers or visitors are under escort of a fully trained employee as determined appropriate by the FTL, STR, or HSO.

e. This topic will be included in site-specific training.

h. One medic first-aid and cardiopulmonary resuscitation (CPR) -qualified individual must be present during all cold test pit activities. Project activity tasks beyond normal cold test pit maintenance activities will require two medic first-aid and CPR-qualified individuals onsite during project-specific activities.

HAZWOPER = hazardous waste operations and emergency response
HASP = health and safety plan

HAZMAT = hazardous material

5. OCCUPATIONAL MEDICAL SURVEILLANCE PROGRAM

Minimal handling of packaged hazardous materials and no hazardous waste handling will occur as a part of the cold test pit activities. No contaminants (listed in 29 CFR Subpart Z) with substance-specific standards have been identified at the project site. If any new contaminants of concern are identified during the course of normal cold test pit maintenance or operations, exposures will be evaluated and quantified to determine whether a substance-specific standard and associated medical surveillance requirements apply. If regulatory-mandated substance-specific standard action levels are triggered, then affected personnel will be enrolled in applicable medical surveillance programs. Employee exposures are not expected to require medical surveillance with the exception of noise. Appendixes to this HASP addressing OMP issues specific to project tasks beyond normal cold test pit maintenance activities will be incorporated as these tasks are identified.

5.1 Injuries on the Site

According to INEEL policy, an OMP physician will examine all injured personnel under the following conditions:

- If an employee is injured on the job
- If an employee is experiencing signs and symptoms consistent with exposure to a hazardous material
- If there is reason to believe that an employee has been exposed to toxic substances or physical or radiological agents in excess of allowable limits.

Note: *Subcontractor employees will be taken to the closest Site medical facility to have an injury stabilized before being transported to the subcontractor's treating physician or medical facility.*

In the event of a known or suspected injury or illness because of exposure to a hazardous substance or physical agent, the employee will be transported to the nearest Site medical facility for evaluation and treatment, as necessary. The project manager, HSO, field team leader, subcontract technical representative, or assigned designee will be responsible for obtaining as much of the following information as possible to accompany the individual to the medical facility:

- Name, job title, work (site) location, and supervisor's name and telephone number
- Substances and physical agents (known or suspected) and material safety data sheet, if available
- Date of employee's first known exposure to the substance or physical agent
- Locations, dates, and results of any airborne exposure monitoring or sampling
- Personal protective equipment in use during this work (e.g., type of respirator and cartridge used)
- Number of days per month PPE has been used
- Anticipated future exposure to the substance or physical agent.

Further medical evaluation will be determined by the examining and treating physician according to the signs and symptoms observed, hazard involved, exposure level, and specific medical surveillance requirements established by the OMP director, in compliance with the OSHA HAZWOPER standard (29 CFR 1910.120 and 192.65).

| As soon as possible after an injured employee has been transported to the Site medical facility, the field team leader, subcontract technical representative, project manager, or assigned designee will make proper notifications.

6. ACCIDENT AND EXPOSURE PREVENTION PROGRAM

Cold test pit activities present numerous potential physical hazards to personnel conducting the required tasks. All personnel must understand and follow the task-specific requirements of this HASP. Engineering controls, hazard isolation, specialized work practices, and the use of PPE will be implemented to eliminate or mitigate potential hazards and exposures. However, all personnel on the site must play their role in the identification and control of hazards.

6.1 Voluntary Protection Program and Integrated Safety Management

The ICP safety process embraces the Voluntary Protection Program (VPP) and ISMS criteria, principles, and concepts to identify and mitigate hazards, thereby preventing accidents. All levels of management and workers are responsible for implementing safety policies and programs and for maintaining a safe and healthy work environment. Project personnel and subcontractors are expected to take a proactive role in preventing accidents; ensuring safe working conditions for themselves and fellow personnel; and complying with all work control documents and approved procedures.

The ISMS is focused on the system side of conducting operations, and VPP concentrates on the people aspect of conducting work. Both programs define work scope, identify and analyze hazards, and mitigate the hazards. Additional information on these programs is available on the company Intranet. Bechtel BWXT Idaho, LLC (current primary management and operating contractor) and its subcontractors participate in VPP and ISMS for the safety of their employees. This document includes all elements of both systems. The five key elements of VPP and ISMS and their corresponding HASP sections are as follows:

| Voluntary Protection Program | Integrated Safety Management System | Health and Safety Plan Section |
|-------------------------------|-------------------------------------|--------------------------------|
| — | Define work scope | Section 1 |
| Work site analysis | Analyze hazards | Section 5, 8, and 9 |
| Hazard prevention and control | Develop and implement controls | Section 6, 7, 8, 9, 10, and 11 |
| Safety and health training | Perform within work controls | Section 4 |
| Employee involvement | Perform work within controls | Section 6 and 8 |
| Management leadership | Provide feedback and improvement | Section 2 and 4 |

6.2 General Safe-Work Practices

The following procedures are mandatory for all ICP and subcontractor personnel working on the site. All site visitors entering the site area (i.e., control zone and beyond) must follow these procedures. Failure to follow these practices may result in permanent removal from the site and other disciplinary actions. The project manager, field team leader, subcontract technical representative, or assigned designee, and the HSO are responsible for ensuring that the following hazard-control practices are followed at the site:

- Limiting access to authorized ICP, subcontractor, and visitor personnel only.
- Ensuring that all personnel have the authority to initiate STOP WORK actions. Use MCP-553, “Stop Work Authority.”

- Ensuring that absolutely no eating, drinking, chewing gum or tobacco, smoking, applying cosmetics, or any other practice occurs that increases the probability of hand-to-mouth transfer and ingestion of materials, except in a designated area.
- Being aware of and complying with all safety signs, color codes, and barriers and adhering to PRD-5 117, “Accident Prevention Signs, Tags, Barriers, and Color Codes.”
- Being alert for dangerous situations, strong or irritating odors, airborne dust or vapors, and broken containers, and reporting all potentially dangerous situations to the project manager, field team leader (or assigned designee), or the HSO.
- Maintaining appropriate spill kits or other containment and absorbent materials at the work site.
- Preventing releases of hazardous materials including those used at the work site; containing (if possible to do so safely) and reporting any spills to the HSO, field team leader, or job-site supervisor (and facility representative where applicable); taking steps to clean up any spills in accordance with the appropriate procedure (e.g., activating the emergency preparedness procedures for the area); and notifying the spill-notification team (at Pager No. 6400) when any hazardous spill occurs. (See Section 11 for more details on the spill-response plan for the work site.)
- Being familiar with the physical characteristics of the site including, but not limited to, the following conditions:
 - Wind direction
 - Accessibility of fellow personnel, equipment, and vehicles
 - Communications at the site and with other nearby facilities
 - Major roads and means of access to and from the site
 - Nearest water sources and fire fighting equipment
 - Warning devices and alarms
 - Capabilities and location of nearest emergency assistance
- Evaluating tasks when wind speeds reach 25 mph or greater, or gusts of 35 mph or greater, by the HSO, radiological control technician, or industrial hygienist for potential work stoppage.
- Locating eyewash stations in the staging areas.
- Meeting applicable regulations for electrical equipment, wiring, cables, switches, and current-overload protection and maintaining them in a manner that provides protection for project personnel from shock hazards and injury and prevents property damage. Providing ground-fault protection whenever outdoor electrical equipment is used also is required.
- Keeping all ignition sources at least 15 m (50 ft) from explosive or flammable environments and using nonsparking, explosion-proof equipment, if advised to use such equipment by a safety professional.

- Implementing the “buddy system” when working in site control zones for all work other than area monitoring and general surveillance activities (see Section 6.4).
- Complying with PRD-5 121, “Personal Protective Equipment,” for personnel wearing contact lenses.

6.2.1 External Chemical Exposure

Bulk chemicals represent sources for external chemical exposures at the site. Basic protective measures used to reduce external exposure include (1) minimizing time for mixing, (2) maximizing the distance from the source of chemicals, and (3) using adequate ventilation whenever possible. The following are methods to minimize external exposure.

6.2.1.1 *Methods for Maximizing Distance from Chemicals.* Workers will maintain safe distances from and minimize exposure to chemicals by:

- Using remote operational controls when appropriate
- Working upwind from the source of chemicals
- Using only the amount of chemicals needed.

6.2.1.2 *Proper Use of Shielding.* Workers will ensure that they are shielded from hazardous weather conditions and harmful substances by the following:

- Taking advantage of the site equipment and enclosures (e.g., wind screens and shields)
- Wearing safety glasses, face shield, or hll-face respirator (depending on the task) to protect eyes from chemical splashes, spills, or vapors.

6.2.2 Internal Chemical Exposure

Chemicals can enter the body through inhalation, ingestion, absorption through wounds, or injection from a puncture wound. Workers will minimize internal chemical exposure by the following:

- Wearing respiratory protection required for the task, performing all leak checks, and inspecting all PPE prior to entering contaminated areas
- Reviewing the SWP, contamination sources, and locations and minimizing or avoiding activities in those areas
- Using portable ventilation and filter equipment when working with or mixing dust or chemical particles
- Not touching the face (adjusting glasses or PPE) or other exposed skin with contaminated gloves
- Following all posted instructions and removing PPE, as prescribed, when exiting contaminated areas and asking the industrial hygienist or HSO for assistance if questions arise
- Washing hands and face before eating, drinking, smoking, or other activity that may provide a pathway for contaminants.

6.3 Nonradiological Contaminant Exposure Avoidance

The waste in the cold test pits will be a simulated waste containing nonradiological constituents (e.g., organic and inorganic chemicals and hazardous materials). The same potential exposure pathways that exist for radionuclide contamination apply equally to nonradionuclide contaminants. Project-specific nonradionuclide contaminants will be documented in the project-specific appendixes. Each contaminant has distinct physical, chemical, and mechanical properties that determine its toxicity. Threshold limit values have been established to provide guidelines in evaluating airborne and skin exposure to these chemicals and materials. They represent levels and conditions under which it is believed that nearly all workers may be exposed day after day without adverse health effects.

The engineering controls normally employed to eliminate or mitigate airborne radioactivity will serve to control nonradiological airborne contaminants. Every effort will be made to isolate the source of these hazards through engineering controls and containment, where feasible. Some of these contaminants pose other exposure hazards from contact and skin absorption; thus, implementing avoidance practices minimizes the potential for exposure. Exposure avoidance at the site may include the following:

- Ensuring ventilation systems are operating as necessary when sources must be opened or handled
- Collecting bags to isolate the source of contamination
- Wearing all required PPE, inspecting all pieces before donning, and taping all seams
- Changing gloves frequently (when soiled) to prevent the spread of contamination
- Changing PPE if it becomes damaged or soiled with source contaminant material (e.g., sludge and waste residue)
- Containerizing samples to avoid handling twice
- Minimizing time in known or suspected contamination areas (e.g., vapors, sludge, and waste residue)
- Washing hands and face before eating, drinking, smoking, or another activity that may provide a pathway for contaminants.

6.4 Buddy System

The two-person buddy system will be used in the work site control zones for all work other than area monitoring and general surveillance activities. This system is to ensure that each worker's mental and physical well-being is monitored during the course of the day. Workers need to be able to see or hear and effectively communicate with their buddy at all times, when in the control zone. Everyone should watch for signs and symptoms of illness or injury in their assigned buddy. A buddy must be able to perform the following tasks:

- Provide assistance
- Verify the integrity of the PPE
- Observe their partner for signs and symptoms of heat stress, cold stress, or contaminant exposure
- Notify other personnel in the control zone, if emergency assistance is needed.

7. SITE CONTROL AND SECURITY

This HASP is designed to support the typical work performed to maintain the cold test pits. Site control and security requirements specific to project tasks beyond normal cold test pit maintenance activities will be added as appendixes to this HASP, as these tasks are identified. Entry into and exit out of site designated work areas will be controlled through the appropriate use of barriers, signs, and other measures in accordance with PRD-2022, “Safety Signs, Color Codes, and Barriers,” or PRD-5117, “Accident Prevention Signs, Tags, Barriers, and Color Codes.” Personnel not directly involved with activities will be excluded from entering designated work areas. Non-field team members, such as inspectors, may be admitted to the site provided they are on official business authorized by the HSO and have met all the site-specific training requirements for the area they have a demonstrated need to access, as shown in Table 1.

The HSO and safety professional should be consulted regarding equipment layout at the project site (in conjunction with the subcontractor superintendent for subcontractor-owned equipment) to minimize personnel hazards from equipment. The focus should be on equipment with stored energy (electrical, pressurized systems, elevated materials and equipment, and chemical), moving and rotating parts (equipment that is guarded and that has open rotating parts such as a drill rig), and other equipment with the potential to result in personnel injuries from being struck-by, caught-between, or entangled in such equipment. The layout of equipment at the project site should reflect the nature of the hazard presented and should be mitigated through the use of engineering controls (e.g., barriers, guards, and isolation), administrative controls (roped off restricted areas or controlled entry access), and qualifications of operators and those assisting in the operation of the equipment, when required.

Good housekeeping will be maintained at all times during the course of the project to include maintaining working and walking surfaces to minimize tripping hazards, stacking or storing materials and equipment in a centralized location when not in use, and regular cleanup of debris and trash that may accumulate at the project site.

Based on the nature of the normal cold test pit maintenance and operations tasks to be completed, a graded approach with two types of site control designations will be used based on the potential hazards, complexity of work tasks, and duration of project tasks. The two types of work areas are the following:

- Designated work areas (DWAs) (established for low-hazard routine cold test pits maintenance and operations tasks)

OR

- Controlled work areas (CWAs) (established for higher hazard tasks).

The primary differences between the work areas will be the size of the area, method of delineation, and postings as determined by the activity being conducted and associated hazards. The determination of what type of work area will be established will be made by the HSO in conjunction with the field team leader, subcontract technical representative, or project designee.

Construction personnel may be used to perform maintenance activities at the cold test pits such as area contouring. A construction area will be established for all construction tasks at the project site.

7.1 Designated Work Area

The DWAs established for the cold test pit maintenance and operational tasks will consist of the general areas currently located inside the fenced cold test pit perimeters. This type of work area will be established where a more restrictive designated work area would not lend itself to the short duration low hazard activities associated with cold test pit maintenance and operations. The boundary of a DWA established within the fenced perimeters will typically be marked with cones or stanchions and generally will not be delineated with rope or ribbon or include other demarcation. All personnel who enter the DWA will wear the appropriate level of PPE for the degree and type of hazards present, as listed in Section 9. All DWAs will be delineated and posted with the appropriate signage based on the hazard being controlled, in accordance with PRD-5117 or PRD-2022.

Support facilities and equipment (e.g., project administrative trailer, vehicle parking, additional emergency equipment, extra PPE, and stored monitoring and sampling equipment) will generally be excluded from the DWA. Visitors who do not have appropriate training or PPE to access the DWA will be restricted from entering.

7.2 Controlled Work Area

The CWAs will be large enough to encompass the equipment and nature of the tasks being conducted to prevent personnel not assigned to the project task and visitors from being exposed to potential safety and health hazards associated with the project tasks. This type of work area will be established where a more restrictive area is required based on increased hazards associated with activities that may include higher hazards. The boundary of the CWA typically will be marked with a combination of stanchions or posts and delineated with rope or ribbon and include warning signs (e.g., construction area) or other demarcation. Only the minimum number of personnel required to safely perform the project tasks will be allowed into the CWA. The CWA is a controlled area during all project tasks and an entry and exit point will be established at the periphery of the CWA to regulate the flow of personnel and equipment. All personnel who enter the CWA will wear the appropriate level of PPE for the degree and type of hazards present, as listed in Section 9.

Factors that will be considered when establishing the CWA boundary include (1) air monitoring data, (2) equipment in use, and (3) the physical area necessary to conduct site operations. The boundary may be expanded or contracted, as this information becomes available, based on the aforementioned factors. The HSO, in conjunction with the safety professional and industrial hygienist, will establish the CWAs. Based on the hazard being controlled, all CWAs will be delineated and posted with the appropriate signage in accordance with PRD-5117 or PRD-2022.

7.3 Construction Area

Construction areas will be large enough to encompass the equipment and nature of the project tasks being conducted to prevent personnel not assigned to the project and visitors from being exposed to potential safety and health hazards associated with the construction tasks. This type of work area will be established where access to the more restrictive construction area is required based on the task hazards determination associated with construction activities. The boundary of the construction area will typically be marked with a combination of stanchions or posts and delineated with rope or ribbon and include warning signs (e.g., construction area) or other demarcation. Only the minimum number of personnel required to safely perform the project tasks will be allowed into the construction area. The area will be controlled at all times. Also, entry and exit points will be established to regulate the flow of personnel and equipment. All personnel who enter the construction area will wear the appropriate level of PPE for the degree and type of hazards present (see Section 9).

Factors that may be considered when establishing the construction area boundary include (1) air monitoring data, (2) equipment in use, and (3) the physical area necessary to conduct site operations. Based on the factors listed above, the boundary may be expanded or contracted as this information becomes available. The HSO, in conjunction with the safety professional and industrial hygienist, will establish the boundary. All CWAs will be delineated and posted with the appropriate signage based on the hazard being controlled and in accordance with PRD-2022.

Note: *The safety professional and industrial hygienist will assist the HSO in establishing the access requirements for the truck or heavy equipment traffic routes, designated work areas, and for the project-based equipment in use.*

7.4 Designated Eating and Smoking Areas

Ingestion of hazardous substances is possible when workers do not practice good personal hygiene habits. It is important to thoroughly wash hands, face, and other exposed skin after completion of work and before smoking, eating, drinking, and chewing gum or tobacco. No smoking, chewing, eating, applying lip balm, or drinking will be allowed within the cold test pit control zones. Personnel will wash their hands prior to using designated eating or smoking areas. Personnel will use only approved facility smoking areas located outside the work zones. Personnel will comply with all smoking policies including disposing of smoking materials in the proper receptacles.

8. HAZARD EVALUATION

The overall objectives of this hazards assessment section are to provide guidance on the following:

- Evaluating cold test pit waste or contaminant generation during normal cold test pit area maintenance and pit area operations to ensure that exposure to chemical agents remains below the exposure potential for cold test pit project personnel by all routes of entry
- Evaluating all cold test pit project tasks to determine the extent that existing chemical and physical hazards may potentially impact the safety of site personnel
- Establishing the necessary monitoring and sampling required to continuously evaluate exposure and contamination levels, determining adequate action levels to mitigate potential exposures, and providing specific actions to be followed if action levels are reached
- Determining engineering controls, isolation methods for contamination, work practices to limit personnel exposure, administrative controls, and appropriate respiratory protection and protective clothing to protect site personnel from hazards.

This HASP has been developed in accordance with MCP-255, “Hazardous Waste Operations and Emergency Response Activity Health and Safety Plans,” and follows the hazard identification, evaluation, and mitigation process found in PRD-25, “Activity Level Hazard Identification, Analysis, and Control.”

8.1 Cold Test Pit Site Activities

Personnel may be exposed to industrial, chemical, and physical hazards while working at the cold test pit sites. Radiological materials are simulated in some areas with rare earth tracers. No radiological contaminants are located at the cold test pits. The degree of hazards posed to onsite personnel entering the cold test pits will be low and typical for hazards associated with light construction and maintenance activities (Loomis et al. 1997). The hazard evaluation specific to project tasks beyond normal cold test pit maintenance activities will be incorporated in appendixes to this HASP, as these tasks are identified. Engineering controls will be implemented whenever possible, along with adequate work practices, real-time monitoring of contaminants, and site-specific hazard training to further mitigate potential exposures and hazards.

Normal cold test pit maintenance and operations tasks, with associated hazards, are summarized in Table 2. The material safety data sheet for all hazardous materials used will be maintained at the job site.

The dominant chemical compounds that are likely to be encountered during cold test pit project tasks are listed in Table 3.

An evaluation of these nonradiological contaminants relative to potential routes of exposure and symptoms of overexposure is presented in Table 4. The main exposure route for contaminants will be from respirable airborne dust during soil excavation and separation activities. Engineering and administrative controls, worker PPE strategies, personnel monitoring, and restricted access to control zones will reduce potential contamination. Most of the nonradiological contaminants listed were selected for use because they have high exposure limits and low potential for exposure to workers.

Table 2. Summary of cold test pits normal maintenance and operations activities, associated hazards, and mitigation.

| Activity or Task | Associated Hazards or Hazardous Agent | Hazard Mitigation |
|---|---|---|
| Cold test pits maintenance and operations activities (Drill rig truck, logging truck, trailers, fork lifts, hydraulic line, and all support equipment) | Chemical and inorganic contaminants — cold test pit weed control activities | Controlled areas, qualified operators, job safety analyses (JSAs), safe work permits (SWPs), technical procedures (TPRs), or work packages. |
| | Equipment movement and vehicle traffic — trailers, drill rig, logging truck, forklift, or pinch points; ergonomic concerns; and struck-by or caught-between potential | Trained operators, JSAs, SWPs, TPRs, qualified heavy equipment operator (hoisting and rigging), designated traffic lanes and areas, watch body position, and wear personal protective equipment (PPE). |
| | Lifting and back strain — moving general equipment and stored materials | Mechanical equipment movement, proper lifting techniques, and two-person lifts. |
| | Subsidence of soil from heavy equipment — on or near cold test pit area pits (seasonal) | Inspect areas before walking on or driving equipment on pit surfaces. |
| | Heat and cold stress | Industrial hygienist monitoring and work-rest cycles, as required. |
| | Tripping hazards and working-walking surfaces — existing probes in ground, ice- and snow-covered surfaces, steps, and ladders | Awareness of probe locations, salt and sand icy areas, and use nonskid or high-friction materials on walking surfaces, where appropriate. |
| | Stored energy sources — electrical lines and panels, elevated materials, hoisting and rigging, and gas cylinders (P-10) | Identify and mark all utilities, ensure all lines and cords are checked for damage and continuity, use ground-fault circuit interrupter on outdoor equipment, comply with minimum clearances for overhead lines, and secure cylinders, caps, and bottles before movement. |
| | Hazardous noise levels — equipment operations or portable generators | Noise surveys and hearing protection (as required). |

Table 3. Potential dominant chemical compounds at cold test pits.

| Chemical | |
|-------------------|----------------------|
| Portland cement | Sodium sulfate |
| Calcium silicate | Sodium hypophosphate |
| Sodium nitrate | Calcium carbonate |
| Potassium nitrate | Calcium hydroxide |
| Sodium chloride | |

The cold test pit site activities do not involve radiological hazards, as the cold test pit areas are free of radiological contamination. The SDA contains known radiological hazards that are not expected to impact work at the cold test pit areas though accidental release of radiological contamination during SDA work could present an exposure hazard to cold test pit workers. An event of this type is covered in Section 11. Radiological work permits, protective equipment, and dosimetry are not required for cold test pit activities. Industrial hygiene monitoring is outlined in Section 8.3.1.

8.2 Routes of Exposure

Exposure pathways for hazardous materials during maintenance and pit operations in the cold test pits are principally the movement of chemicals and simulated waste forms. Engineering controls, training, and work controls will mitigate potential contact and chemical exposure to these materials. Cold test pit activities do not present a significant potential for exposure to workers, but cold test pit activities can expose workers in the following ways:

- Inhalation of chemical compounds and fugitive dust during intrusive activities and examination tasks. This contamination may be in vapor, dust, or mist form. Inhaling these compounds or dust results in potential lung deposition.
- Skin absorption and contact with organic and inorganic compounds that can be absorbed through unprotected skin, resulting in chemical burns and uptake through skin absorption and skin contamination.
- Ingestion of organic and inorganic compounds adsorbed to dust particles or waste residues, resulting in uptake of contaminants through the gastrointestinal tract causing irritation, internal tissue damage, and deposition to target organs.
- Injection while handling simulated waste material components containing organic or inorganic materials by breaking the skin or migration through an existing wound, resulting in localized irritation, uptake of soluble components, and deposition of insoluble components.

Table 4. Evaluation of nonradiological contaminants at the cold test pit work sites.

| Chemical Exposure | Exposure Limit | Routes of Exposure | Instrumentation Used for Monitoring | Target Organs or System | Carcinogen? | Exposure Potential (All Routes Relative to Personal Protective Equipment) |
|---|---------------------------------------|---|--|--|-------------|---|
| Sodium nitrate | 3 mg/m ³ respirable dust | Inhalation, ingestion, and contact hazard | Personal sampling pump with cyclone and filter | Local irritant | No | Low |
| Sodium sulfate | 3 mg/m ³ respirable dust | Inhalation, ingestion, and contact hazard | Personal sampling pump with cyclone and filter | Local irritant | No | Low |
| Sodium chloride | 3 mg/m ³ respirable dust | Inhalation and ingestion | Personal sampling pump with cyclone and filter | Local irritant | No | Low |
| Sodium hypophosphate | 3 mg/m ³ respirable dust | Inhalation, ingestion, and contact hazard | Personal sampling pump with cyclone and filter | Local irritant | No | Low |
| Calcium carbonate | 10 mg/m ³ respirable dust | Inhalation and ingestion | Personal sampling pump with cyclone and filter | Local irritant: kidneys and central nervous system | No | Low |
| Calcium hydroxide | 5 mg/m ³ respirable dust | Inhalation, ingestion, and contact hazard | Personal sampling pump with cyclone and filter | Local irritant | No | Low |
| Calcium silicate | 10 mg/m ³ respirable dust | Inhalation, ingestion, and contact hazard | Personal sampling pump with cyclone and filter | Local irritant | No | Low |
| Potassium nitrate | 3 mg/m ³ respirable dust | Inhalation, ingestion, and contact hazard | Personal sampling pump with cyclone and filter | Local irritant: kidneys and blood | No | Low |
| Portland cement | 10 mg/m ³ respirable dust | Inhalation, ingestion, and contact hazard | Personal sampling pump with cyclone and filter | Local irritant | No | Low |
| Crystalline silica—quartz (from native soils) | 0.1 mg/m ³ respirable dust | Inhalation | Personal sampling pump with cyclone and filter | Lung | Yes | Low |

8.3 Environmental and Personnel Monitoring

The potential for exposure to nonradiological industrial hygiene airborne and contact hazards exists during tasks involving direct handling of chemicals and the simulated waste materials. These hazards will be present at low levels during completion of most tasks taking place at the cold test pit sites and only affects personnel who work directly with the materials in the control zones. Use of operating procedures, engineering and administrative controls, worker training, and protective equipment will mitigate most of these hazards. Monitoring with direct-reading instruments will be conducted to provide industrial hygiene personnel with real-time data to assess the effectiveness of these controls. Potential exposure issues relative to project-specific tasks (beyond normal cold test pit maintenance activities) will be addressed in appendixes to this document and incorporated as these tasks are identified.

The greatest exposure potential from cold test pit activities will be the inhalation of chemicals. The industrial hygienist and HSO will focus on these activities and monitor with direct-reading instrumentation and full- and partial-period air sampling in accordance with the applicable technical procedures, as deemed appropriate. Other workers and areas of the site will also be monitored to determine the level of chemical exposure to workers. Safety hazards and other physical hazards will be monitored and controlled, as outlined in Section 8.4. Specific hazardous-agent exposures that will be monitored are listed on Table 5.

Table 5. Action levels and associated responses for cold test pit project hazards.

| Contaminant or Agent Monitored | Action Level | Response Taken if Action Level is Exceeded |
|---|--|--|
| Dust | >5 mg/m ³ | Continue working, increase dust control, and monitor with sample pump with appropriate media. |
| Respirable dust | >1.5 mg/m ³ | Continue working, increase dust control, and monitor with sample pump with appropriate media. |
| Noise | 8-hour TWA >85 dBA | Wear hearing protection, continue working, and monitor with sound-level meter or noise dosimeter. |
| | 10-hour TWA >83 dBA | Wear hearing protection, continue working, and monitor with sound-level meter or noise dosimeter. |
| Heat stress | Temperatures >90°F or use of full anti-contamination protective clothing | Implement MCP-2704, "Controlling Exposure to Heat and Cold Stress"; adhere to appropriate work and rest schedule; and monitor with heat stress monitor (wet-bulb globe temperature). |
| TWA = time-weighted average dBA = decibel A-weighted MCP = management control procedure | | |

8.3.1 Industrial Hygiene Monitoring

All full- and partial-period airborne contaminant sampling will be conducted using applicable NIOSH or OSHA methods and in conformance to the company *Safety and Health Manual*. Risk assessments for site personnel will be conducted in accordance with MCP-153, "Industrial Hygiene Exposure Assessment."

All monitoring instruments will be maintained and calibrated in accordance with the manufacturer's recommendations, existing industrial hygiene protocol, and in conformance to the *INEEL Safety and Health Manual*. Direct-reading instruments will be calibrated, at a minimum, prior to daily use and, more frequently, as determined by the project industrial hygienist. Calibration information, sampling

and monitoring data, results from direct-reading instruments, and field observations will be recorded per Section 3.

8.4 Physical Hazards Evaluation, Control, and Monitoring

This section describes the physical hazards present at the work site during normal maintenance and cold test pit operations, and the methods that will be used to monitor and control them. It will be critical that all personnel are aware and understand the nature of the tasks that will be conducted, the equipment to be used, and the controls in place to eliminate or mitigate potential safety hazards. Physical hazard issues relative to project-specific tasks (beyond normal cold test pit maintenance activities) will be addressed in appendixes to this HASP and will be incorporated as these tasks are identified.

8.4.1 Temperature Extremes

The cold test pit project activities will be conducted during months when there will be little potential that heat- or cold-stress factors could adversely affect task-site personnel because of ambient air temperatures and layered PPE.

8.4.1.1 Heat Stress. Outside temperatures are expected to be variable during cold test pit project activities and personnel may be required to wear protective clothing that prevents the body from cooling. High ambient air temperatures can result in increased body temperature, heat fatigue, heat exhaustion, or heat stroke that can lead to symptoms ranging from physical discomfort to unconsciousness and death. Employees will inform the field team leader, subcontract technical representative, project designee, or the HSO when they experience any of the signs or symptoms of heat stress or observe that a fellow employee or “buddy” is experiencing these signs or symptoms. In addition, the INEEL *Safety and Health Manual*; MCP-2704, “Controlling Exposure to Heat and Cold Stress”; and Table 6 describe heat stress hazards and symptoms.

Individuals showing any of the symptoms of heat exhaustion listed in Table 6 will stop work, move to a shaded area to rest, be provided cool drinking water, and be monitored by a medic, CPR/first-aid-certified employee. If employees exhibiting signs or symptoms of heat stress do not show signs of immediate recovery when removed to the rest area, they will be transported to the nearest medical facility for medical attention.

Monitoring for heat stress conditions will be performed in accordance with MCP-2704. Depending on the ambient weather conditions, work conditions, type of PPE worn, and the physical response of personnel, the industrial hygienist or radiological control technician will inform the field team leader, subcontract technical representative, or project designee of necessary adjustments to the work and rest cycle. In addition, physiological monitoring may be conducted to determine whether personnel are replenishing liquids fast enough. A supply of cool drinking water will be provided in designated eating areas and consumed only in these areas. Workers may periodically be interviewed by the industrial hygienist or HSO to ensure that the controls are effective and that excessive heat exposure is not occurring. Workers will be encouraged to monitor their body signs and to take breaks if symptoms of heat stress occur.

Note: *Heat exhaustion and heat stroke are extremely serious conditions that can result in death and should be treated as such. Transport individual immediately to the nearest medical facility.*

Table 6. Heat stress signs and symptoms.

| Heat-Related Illness | Signs and Symptoms | Emergency Care |
|----------------------|---|--|
| Heat rash | Red skin rash and reduced sweating | Keep the skin clean, change all clothing daily, and cover the affected areas with cornstarch or powder containing cornstarch. |
| Heat cramps | Severe muscle cramps, exhaustion, sometimes accompanied by dizziness or periods of faintness | Move the patient to a nearby cool place and give patient half-strength electrolytic fluids. If cramps persist, or if more serious signs develop, seek medical attention. |
| Heat exhaustion | Rapid, shallow breathing; weak pulse; cold, clammy skin; heavy perspiration; total body weakness; dizziness that sometimes leads to unconsciousness | Move the patient to a nearby cool place, keep the patient at rest, give the patient half-strength electrolytic fluids, treat for shock, and seek medical attention. DO NOT TRY TO ADMINISTER FLUIDS TO AN UNCONSCIOUS PATIENT. |
| Heat stroke | Deep, then shallow breathing; rapid, strong pulse, then rapid, weak pulse; dry, hot skin; dilated pupils; loss of consciousness (possible coma); seizures or muscular twitching | Cool the patient rapidly. Treat for shock. If cold packs or ice bags are available, wrap them and place one bag or pack under each armpit, behind each knee, one in the groin, one on each wrist and ankle, and one on each side of the neck. Seek medical attention as quickly as possible. Monitor the patient's vital signs constantly. DO NOT ADMINISTER FLUIDS OF ANY KIND. |

8.4.1.2 Low Temperatures. Exposure to low temperatures may be a factor during times of cold test pit activities. Relatively cool, ambient temperatures and wet or windy conditions increase the potential for cold injury to personnel. The project industrial hygienist and HSO will be responsible for obtaining meteorological information to determine whether additional cold-stress administrative controls are required. Project personnel will also be cautioned regarding cold-stress factors associated with rapid cooling once impermeable PPE layers are removed, causing the potential for freezing of accumulated moisture on PPE outer and inner surfaces under extremely cold conditions.

The hazards of cold stress are discussed in MCP-2704. Cold-stress conditions will be monitored in accordance with the companywide safety and health manuals.

The following are provided as general measures for inner clothing layers to prevent cold stress:

- Workers should wear layered warm clothing (e.g., heavy socks and hooded garments) when the air temperature will be below 40°F (4°C). When the air temperature will be below 30°F (-1°C), clothing for warmth will be worn in addition to any required project-specific PPE, depending upon worker comfort. Warm clothing may include the following:
 - Insulated suits (e.g., whole-body thermal underwear)
 - Wool or polypropylene socks to keep moisture off the feet if there will be a potential for work activity that could cause sweating
 - Insulated glove liners and gloves with reflective surfaces that reflect body heat back to the hand should be used when air temperatures are extremely low (i.e., less than 5°F [-15°C])
 - Insulated boots and head cover (e.g., hard hat liners).

- At air temperatures below 30°F (-1.1°C), the following work practices will be followed:
 - Outer layers of clothing must be impermeable to water if the worker's clothing will become wet on a job site
 - Workers must change into dry clothing immediately if underclothing becomes wet; however, if the clothing becomes wet from sweating, the workers may finish the task that caused the sweating before changing into dry clothing
 - Workers will be provided a warm area (65°F [18.3°C] or above) to change from work clothing into street clothing
 - Workers will be provided a warm break area (60°F [15.6°C] or above)
 - Space heaters may be provided in the work area, if appropriate
 - Hot liquids such as soups or sweet drinks will be provided in the break area, but the intake of caffeine will be limited because of diuretic and circulatory system effects
 - The buddy system will be practiced at all times, and any personnel observed with severe shivering will leave the cold area immediately
 - Workers should layer their clothing (i.e., thinner, lighter clothing should be layered under heavier clothing)
 - Workers handling liquids that evaporate easily (e.g., gasoline or diesel fuel) will take special precautions to avoid soaking clothing or gloves with the liquids because of the added danger of cold injury caused by evaporative cooling
 - Work will be planned to minimize the need for workers to sit or stand still for long periods of time.

Additional cold weather hazards exist from working on snow- or ice-covered surfaces. Slip, fall, and material-handling hazards are increased under these conditions. Every effort must be made to ensure walking surfaces are kept clear of ice. The project manager, field team leader, subcontract technical representative, project designee, or HSO should be notified immediately if slip or fall hazards are noted at the cold test pit sites.

8.4.2 Noise

Excessive noise (noise levels greater than 85 dBA for 8 hours) may be present on the project because heavy equipment, portable generators, and power tools are used. Personnel assigned to the project may be exposed to levels of noise greater than 85 dBA in an 8-hour time-weighted average (TWA) or 83 dBA for a 10-hour TWA. The effects of high sound levels (noise) may include the following:

- Personnel being startled, distracted, or fatigued
- Physical damage to the ear, pain, and temporary or permanent hearing loss
- Interference with communication that would warn of danger

Noise measurements will be performed by the industrial hygienist in accordance with MCP-2719, "Controlling and Monitoring Exposure to Noise," to determine whether personnel assigned to the jobs identified are above allowable-noise-exposure levels. A threshold limit value of 85 dBA will be applied to

personnel exposed to noise levels over no more than an 8-hour day. This level is based on a 16-hour recovery period in a low-noise environment. If personnel are required to work longer than 8 hours in a hazardous noise environment, then the threshold limit value will be adjusted to a lower value. The project industrial hygienist must be consulted regarding modifications to the 85 dBA for an 8-hour TWA and 83 dBA for a 10-hour TWA value.

Personnel will be enrolled in the INEEL OMP or appropriate subcontractor Hearing Conservation Program when noise exposure routinely meets or exceeds the allowable level. Personnel working on jobs that have noise exposures greater than 85 dBA for an 8-hour TWA or 83 dBA for a 10-hour TWA will be required to wear hearing protection until noise levels have been evaluated and will continue to wear the hearing protection specified by the industrial hygienist until directed otherwise.

8.4.3 Fire, Explosion, and Material Handling

Fires, explosions, and reactive material hazards at the cold test pits include potential combustible materials near ignition sources (hot motors or exhaust systems), transfer and storage of flammable or combustible liquids in the control zones, and chemical reactions (reduction, oxidation, and exothermic) from incompatible simulated waste materials. Portable fire extinguishers, with a minimum rating of 10A/60BC, will be strategically located at the site to combat Class ABC fires. Fire extinguishers will be located in all active work areas, on or near site equipment that has exhaust heat sources, and on or near all equipment that is capable of generating sparks.

Combustible or ignitable material in contact with or near exhaust manifolds, catalytic converters, or other ignition sources could result in a fire. The HSO will work with the project fire protection engineer to identify these sources, as equipment is brought on the site. The accumulation of combustible material will be strictly controlled at the cold test pit sites. Trash and weeds will be controlled at the job site to maintain a 9-m (30-ft) defoliated zone around equipment and structures. Combustibles (e.g., trash, cardboard, rags, wood, and plastic) will be properly disposed of in metal receptacles.

Gasoline or diesel fuel that will be used at the task site for generators and decontamination equipment (e.g., steam cleaner, if required for cold test) will be safely stored, handled, and used. Only flammable liquid containers approved by Underwriters Laboratories and labeled with the contents will be used to store fuel. All fuel containers will be stored at least 15 m (49 ft) from any facilities and ignition sources or stored inside an approved flammable storage cabinet. Additional requirements are provided in the INEEL *Safety and Health Manual* and in MCP-584, "Flammable and Combustible Liquid Storage and Handling."

Portable motorized equipment (e.g., generators and light plants) will be shut off and allowed to cool down in accordance with manufacturer operating instructions, prior to refueling, to minimize the potential for a fuel fire. Only qualified fuel-handling personnel will conduct fueling tasks.

8.4.4 Biological Hazards

The cold test pits are located in an area that provides habitat for rodents, insects, and reptiles. Based on biological studies at the INEEL, deer mice have been known to carry the Hantavirus. The virus can be present in the nesting and fecal matter of deer mice. A potential exists for project personnel to disturb nests or fecal matter during the course of mobilization and intrusive activities. If such materials are disturbed, they can become airborne and create a potential inhalation pathway for the virus. Also, contact with and improper removal of these materials may provide additional inhalation exposure risks.

If suspect rodent nesting or excrement material is encountered, the field team leader, subcontract technical representative, industrial hygienist, and HSO will be notified immediately and no attempt will be made to remove the matter or clean the area. Following an evaluation of the area, an SWP will be written for disinfecting and removing the matter from the project task area. The industrial hygienist will provide the necessary guidance for protective equipment, mixing, and application of the disinfecting solution (bleach solution), and proper disposal method of the waste. Typical PPE for disinfecting and removing a large nesting area may include a hll-face respirator with a high-efficiency particulate air (HEPA) filter cartridge, Tyvek coveralls, outer booties, and two pairs of gloves (latex inner and nitrile outer). Generally, all seams including mating and overlapping PPE ensemble pieces will be taped.

Snakes, spiders, and insects (e.g., ticks and mosquitoes) may also be encountered at the cold test pit sites. Common areas of infestation include material stacking and staging areas, under existing structures (e.g., trailers and buildings), under boxes, and other areas that provide shelter. Protective clothing will prevent insects from direct contact with personnel; however, repellant may be required during Level D activities. Areas where standing water has accumulated provide breeding grounds for mosquitoes and should be avoided. In cases where large areas of standing water are encountered, it may be necessary to pump them dry or add a small concentration of nonhazardous surfactant to the water to break the surface tension during mosquito hatching phases. Consult with the environmental coordinator before adding surfactant to standing water.

8.4.5 Confined Spaces

No confined space has been identified or is anticipated at the cold test pits during normal maintenance and operations activities. If project-specific activities have the potential to create confined space conditions, an appendix to this HASP will be generated and added to this document to address these issues.

Work in a confined space may subject personnel to risks involving engulfment, entrapment, oxygen deficiency, and toxic or explosive atmospheres. If a suspected confined space is discovered and not properly posted, it will be treated as a permit-required confined space until a determination is made by an assigned safety and industrial hygienist professional. Entrances will be posted with the required danger or caution sign per MCP-2749, “Confined Spaces.” A confined space entry permit is required before an employee can enter a confined space per MCP-2749.

8.4.6 Safety Hazards

Industrial safety hazards pose a significant, if not the most likely, threat to personnel that will be encountered while performing tasks at the cold test pit sites. Section 6 provides general safe-work practices that must be followed at all times. The following sections describe specific industrial safety hazards and procedures to be followed to eliminate or minimize potential hazards to project personnel.

8.4.6.1 Handling Heavy Objects. Heavy equipment operations on the project (i.e., handling and maneuvering drilling cases, bits, full-core sections, various other materials or pieces of equipment) can result in employee injury. Manual material handling will be minimized through task design and use of mechanical or hydraulic lifts, whenever possible.

8.4.6.2 Powered Equipment and Tools. All powered equipment and tools will be properly maintained and used by qualified individuals in accordance with the manufacturer’s specifications. For all work performed with powered equipment, PRD-5 101, “Portable Equipment and Handheld Power Tools,” will be followed.

8.4.6.3 Heavy Equipment and Moving Machinery. The hazards associated with the operation of heavy equipment include injury to personnel, equipment, and property damage. All heavy equipment will be operated properly and in accordance with the manufacturer's instructions. Only authorized personnel will be allowed in the vicinity of operating heavy equipment and should maintain visual communication with the operator. Work-site personnel will comply with MCP-2745, "Heavy Industrial Vehicles"; and MCP-2743, "Motor Vehicle Safety."

Site personnel working around or near heavy equipment and other moving machinery will comply with the appropriate MCPs and STD-1090-99, "Hoisting and Egging." Additional safe practices will include the following:

- Ensuring that all heavy equipment has functioning backup alarms
- Prohibiting walking directly in back of or to the side of heavy equipment without the operator's knowledge and taking all necessary precautions prior to moving heavy equipment
- Ensuring that the equipment operator maintains communication, while operating heavy equipment in the work area, with a designated person responsible for providing direct voice contact or approved standard hand signals and for ensuring all site personnel in the immediate work area are made aware of the equipment operations
- Keeping all equipment out of traffic lanes and access ways and storing all equipment to avoid endangering personnel at all times.

8.4.6.4 Electrical Hazards and Energized Systems. Electrical equipment and tools, as well as underground lines, may pose shock or electrocution hazards to personnel. Safety-related work practices will be employed to prevent electric shock or other injuries resulting from direct or indirect electrical contact. If work on energized systems is necessary, these practices will conform to the requirements in PRD-5099, "Electrical Safety"; PRD-5051, "Chapter IX-Lockout and Tagout"; MCP-3650, "Chapter IX Level I Lockouts and Tagouts"; and Parts I through III of National Fire Protection Association (NFPA) Standard 70E, "Standard for Electrical Safety Requirements for Employee Workplaces." In addition, all electrical work will be reviewed and completed under the appropriate work controls (i.e., HASP, SWPs, and work orders).

Before beginning any subsurface penetrations, underground utility clearances will be obtained by contacting telecommunications (526-1688 or 526-2512). Subsurface investigation clearance will be obtained in accordance with MCP-6205, "Subsurface Investigations." The requirements for advanced 48-hour notice will be met.

8.4.6.5 Personal Protective Equipment. Wearing PPE may reduce a worker's ability to move freely, see clearly, and hear directions and noise that might indicate a hazard. Also, PPE may increase the risk of heat stress. Work activities at the task site will be modified as necessary to ensure that personnel are able to work safely in the required PPE. Work-site personnel will comply with PRD-5121. The cold test pit project PPE levels for each task are described in Section 9.

8.4.7 Inclement Weather Conditions

When inclement or adverse weather conditions develop that may pose a threat to persons or property at the task site (such as sustained strong winds 25 mph or greater), electrical storms, heavy precipitation, or extreme heat or cold), these conditions will be evaluated and a decision made by the HSO (with input from the industrial hygienist, safety engineer, and other personnel as appropriate) to stop

work, employ compensatory measures, or to proceed. The field team leader, subcontract technical representative, or project designee shall comply with INEEL MCPs and site work control documents that specify limits for inclement weather.

8.4.8 Dust Control

During site activities, the project HSO or industrial hygienist will determine whether wind or other weather conditions pose unacceptable exposure hazards to personnel or the environment. Methods such as surfactants, wetting, and enclosures may be used to assist in dust control. Administrative controls such as designating routes of travel or restricting access to areas also may be implemented.

8.5 Other Site Hazards

Site personnel should continually look for potential hazards and immediately inform the safety engineer or HSO of the hazards so that action can be taken to correct the condition.

During scheduled work activities, the field team leader, subcontract technical representative, and HSO will conduct daily inspections of task sites to ensure that barriers and signs are being maintained, unsafe conditions are corrected, and debris is not accumulating. Health and safety professionals present at the task sites may, at any time, recommend changes in work controls to the field team leader or subcontract technical representative. However, all changes that may affect the cold test pit project's written work control documents (e.g., HASP and SWPs) must have concurrence from the appropriate project technical discipline representative onsite and have a document action request prepared on Form 412.11, "Document Management Control system (DMCS) Document Action Request (DAR)," as required.

Personnel working at the task sites are responsible to use safe-work techniques, report unsafe working conditions, and exercise good personal hygiene and housekeeping practices throughout the course of their jobs.

9. PERSONAL PROTECTIVE EQUIPMENT

The cold test pit sites pose low to moderate potential hazards to personnel from construction, operation, and maintenance activities. Anyone entering the cold test pits must be protected against these potential hazards. Personal protective equipment requirements relative to project-specific tasks beyond normal cold test pit maintenance activities will be addressed in appendixes to this HASP and will be incorporated as these tasks are identified.

The purpose of PPE will be to shield or isolate personnel from chemical, physical, or biological hazards that cannot be eliminated through engineering or other controls and that may be encountered at the cold test pit sites. It is important to realize that no PPE ensemble can protect against all hazards under all conditions and that work practices and adequate training also will provide a greater level of protection to workers.

Minimum PPE requirements for work in the cold test pits work control zones are as follows:

- Hard hat
- Eye protection (safety glasses with side shields)
- Sturdy leather boots
- Leathers gloves for material handling.

Selection of the proper PPE to protect cold test pit site personnel is based on the following:

- Potential routes of entry
- Physical form and chemical characteristics of simulated waste components
- Acute and chronic effects from exposure to simulated waste components
- Local and systemic toxicity of contaminants
- Anticipated exposure levels (i.e., surface and airborne)
- Hazard evaluation (see Section 8).

The PPE will generally be divided into two broad categories: (1) respiratory protective equipment and (2) personal protective clothing. Both of these categories are incorporated into the standard four levels of protection (i.e., Levels A, B, C, and D) based on the potential severity of cold test pit project hazards. Guidance in the selection process for respiratory and protective clothing is presented in Table 7. Cold test pit site-specific hazards and contaminants will be evaluated in determining the most appropriate PPE level and modifications. See the applicable appendix for project-specific information on PPE requirements.

Table 7. Respiratory and protective clothing selection.

| Hazard | Level of Protection |
|--|---|
| Respiratory PPE Selection ^a | |
| Not immediately dangerous to life or health (IDLH) or oxygen deficient atmospheric conditions. Gaseous, vapor, particulate, and aerosol chemicals and radionuclides. | <p>Level C—full-facepiece, as determined by the industrial hygienist</p> <p>Level B—full-facepiece supplied air respirator with an air-purifying escape cartridge or airhood (bubblehood)</p> <p>High-efficiency particulate air or chemical combination cartridge for concentrations up to the protection factor of an air-purifying full-facepiece respirator</p> |
| IDLH or oxygen deficient atmospheric conditions. Gaseous, vapor, particulate, and aerosol chemicals and radionuclides. | <p>Level B—full-facepiece, supplied air respirator with an escape-only self-contained breathing apparatus (SCBA) or</p> <p>Level A—SCBA</p> <p>HEPA/chemical combination cartridge for concentrations up to the protection factor of an air-purifying full-facepiece respirator</p> |
| Protective Clothing Selection | |
| Low atmospheric contaminant levels that are present under stable conditions. No anticipated immersion, splashes, or potential for unexpected contact with chemicals. | Level D |
| Moderate atmospheric contaminants under relatively stable conditions, liquid splashes or other direct contact that do not have corrosive characteristics or can be absorbed by exposed skin. Low radionuclide contamination. | Level C |
| <p>a. If required, a high-efficiency particulate air or multichemical combination cartridge will be selected by industrial hygiene personnel based on specific task hazards.</p> | |

9.1 Personal Protective Equipment Levels

The following sections provide detail and explanation of the two most likely levels of PPE to be used at the cold test pits. Based on the hazard evaluation and recommendations cited above, the most common level of PPE used at the cold test pits will be Level D. Some potential exists for the requirement to upgrade to a modified Level D or Level C in some site-specific activities. Modifications to these levels will be made under the direction of the HSO in consultation with the project industrial hygienist and safety engineer, as appropriate. Such modifications are routinely employed during HAZWOPER site activities to maximize efficiency and to meet site-specific needs without compromising personnel safety and health.

9.1.1 Level D Personal Protective Equipment

Level D PPE, with potential upgrade to a modified Level D, will serve as the primary PPE for cold test pit activities. Level D PPE affords little protection against chemical hazards and provides no protection against airborne chemical hazards. Level D will be appropriate for use when personnel hazardous chemical exposure is not expected to be above an allowable limit and no danger exists because of absorption of chemicals through the skin. Level D is basically a standard work uniform. This level of PPE at the work site consists of the following:

- Street clothes and coveralls, as required by the industrial hygienist and safety engineer
- Hard hat
- Eye protection (i.e., safety glasses with side shields)
- Approved safety footwear, as specified by the safety engineer.

Optional Level D modifications consist of the following:

- Chemical protective clothing (e.g., Tyvek and Saranex), as prescribed in the task-specific work control documents
- Chemically resistant hand and foot protection (e.g., inner or outer gloves and boot liners)
- Any specialized protective equipment (e.g., hearing protection, cryogenic gloves, face shields, and aprons).

9.1.2 Level C Personal Protective Equipment

For normal cold test pit maintenance and operations, Level C PPE is not expected to be required. Level C PPE may be appropriate for some work at the task site when the contaminants are well characterized, the hazard exposure to personnel by skin absorption is minimal, and the threat is very small that an immediately dangerous-to-life-or-health condition will develop. Personnel working at the work site and wearing Level C PPE will wear the following:

- Level D ensemble with the following upgrades:
 - Chemical-resistant coveralls (i.e., Tyvek QC, Tychem 7500, or Saranex-23-P), as prescribed by the industrial hygienist
 - Air purifying respirator
 - Chemical-resistant (e.g., rubber and nitrile) outer shoe and boot cover
 - Approved safety foot wear, as specified by the safety engineer
 - Inner gloves (e.g., rubber and nitrile)
 - Outer gloves (e.g., nitrile and rubber)
 - Hard hat

- Eye protection (i.e., safety glasses with side shields).
- Optional Level C modifications:
 - Any specialized protective equipment (i.e., hearing protection, welding lens, and aprons).

9.2 Protective Clothing Upgrading and Downgrading

The cold test pit project HSO in consultation with the project industrial hygienist and safety engineer will be responsible for determining when to upgrade or downgrade PPE requirements. Upgrading or downgrading PPE requirements based on current conditions is a normal occurrence. The action levels listed on Table 5 provide the basis for determining such decisions.

Additional reasons for upgrading or downgrading PPE are listed below:

- Upgrading criteria (work will stop immediately if PPE upgrading is required):
 - Unstable or unpredictable site nonradiological hazards
 - Contaminants that present difficulty in monitoring or detecting
 - Known or suspected presence of skin absorption hazards
 - Temporary loss or failure of any engineering controls
 - Identified source or potential source of a respiratory hazard
 - Change in the task procedure that may result in increased contact with contaminants or meeting any of the criteria listed above.
- Downgrading criteria:
 - New information or monitoring data that shows the contaminant levels to be lower than established action limits
 - Implementation of new engineering or administrative controls that eliminate or significantly mitigate hazards
 - Elimination of potential skin absorption or contact hazards
 - Change in site conditions that results in removal of physical hazards or reduces or isolates them to a controlled area
 - Completion or change in tasks that results in the elimination of key hazards that require higher levels of PPE.

9.3 Inspection of Personal Protective Equipment

All PPE ensemble components must be inspected prior to use and when in use within the cold test pit project work zones. Self-inspection and the use of the buddy system, once PPE is donned, will serve as the principal forms of inspection. If at any time, PPE should become damaged or degraded, the worker

will inform others of the problem and proceed directly to the work zone exit point to doff and replace the unserviceable equipment. In addition, all PPE that becomes grossly contaminated or presents a potential source for the spread of such contamination will require decontamination or replacement. An inspection checklist for common PPE items is provided in Table 8.

Table 8. Personal protection equipment inspection checklist.

| Personal Protection Equipment Item | Inspection |
|------------------------------------|--|
| Rubber gloves | <p>Before use:</p> <ul style="list-style-type: none"> • Pressurize gloves to check for pinholes. Blow in the glove and then roll until air is trapped and inspect. No air should escape. |
| Levels D and C | <p>Before use:</p> <ul style="list-style-type: none"> • Visually inspect for imperfect seams, nonuniform coatings, and tears. Hold the personal protection equipment (PPE) up to the light and inspect for pinholes, deterioration, stiffness, and cracks. <p>While wearing PPE in the work zone:</p> <ul style="list-style-type: none"> • Check for evidence of chemical attack such as discoloration, swelling, softening and material degradation. Inspect for tears, punctures, and zipper or seam damage. Check all taped areas to ensure that they are still intact. |

10. DECONTAMINATION PROCEDURES

No known radionuclides are present at the cold test pits. The chemicals used are a minor hazard and do not pose significant contamination concerns. No decontamination procedures apply to the work in this **HASP** other than those that would be determined by the project industrial hygienist, should a situation requiring such procedures arise.

See the applicable project-specific appendix for information on required decontamination procedures.

11. EMERGENCY RESPONSE PLAN FOR COLD TEST PIT SITES

This section defines the responsibilities of the cold test pits and the INEEL ERO by providing an emergency response plan for guidance in responding to abnormal events during treatability study activities.

The emergency response plan addresses OSHA emergency response as defined by the HAZWOPER standard (29 CFR 1910.120 and 1926.65); DOE emergencies as defined by DOE Order 151.1A, "Comprehensive Emergency Management System"; and DOE Order 232.1A, "Occurrence Reporting and Processing of Operations Information." The emergency response plan will be implemented in concert with "INEEL Emergency Plan/RCRA Contingency Plan" (PLN-114).

The INEEL Emergency Plan may be activated in response to events occurring at cold test pit sites or at the discretion of the emergency coordinator. Once the INEEL Emergency Plan is activated, project personnel will follow the direction and guidance communicated by the emergency coordinator.

Note: *The OSHA does not define "emergency" the same as DOE. For simplicity, the term "emergency" is used in this section of the HASP to refer to events covered by either the OSHA or the DOE definition.*

This section provides the following emergency response instructions for cold test pit task-site personnel:

- Emergency warning signals and evacuation routes
- Personnel accountability procedures
- Emergency medical services and fire, rescue, and HAZMAT emergency response
- Task-site emergency communications
- Emergency equipment and supplies located at the task site
- Notification procedures for emergency response to the task site

The cold test pit work tasks do not produce risks that could reasonably be expected to cause an emergency evacuation. Task-site personnel could be affected by an emergency event at an INEEL facility, such as the nearby RWMC.

All emergencies will be reported through the RWMC shift supervisor or facility manager to ERO personnel for classification in accordance with Section 4 of the "INEEL Emergency Plan/RCRA Contingency Plan," Addendum 3 (PLN-114). If a facility ERO is activated, task-site emergency response will follow the "INEEL Emergency Plan/RCRA Contingency Plan," Addendum 3 (PLN-114).

Response to and mitigation of task-site emergencies will require the expertise of both task-site personnel and INEEL emergency response personnel. Examples of emergencies that could occur include the following:

- Accidents resulting in injury
- Accidents resulting in chemical exposure of personnel

- Fires
- Explosions
- Spills of hazardous materials
- Tornadoes, earthquakes, and other adverse natural phenomena
- Vehicle or transportation emergencies
- Emergencies at nearby facilities or wildfires that could prompt evacuation or take-cover actions at the task site.

11.1 Types of Emergency Events

Note: *This HASP addresses three types of emergency events, as described in the following sections. Each event type may require a different response action by project personnel, but all events will be reported to the RWMC shift supervisor.*

11.1.1 Events Requiring Emergency Notifications But No Evacuation

Certain events require courtesy notifications but do not require a response from the INEEL ERO. In these cases, the field team leader, subcontract technical representative, or project designee will immediately notify personnel identified in Section 11.5 of this HASP (the RWMC shift supervisor, the Warning Communications Center [WCC], INEEL subcontractor project and department personnel including the WAG 7 manager of projects who will notify DOE) and other appropriate parties as listed in Section 11.8. The notification should describe the event and state that no emergency response support is required. Examples of these types of events include, but are not limited to, the following:

- Personal injury at the site that requires medical evaluation or treatment but does not require an ambulance response
- Personnel contamination or suspected uptake of a hazardous substance not requiring emergency medical treatment
- Equipment or vehicle accident that results in damage to the vehicle or property ONLY
- A small fire that can be controlled with a hand-held fire extinguisher (all fires must be reported to the INEEL fire department)
- Any spill as defined by MCP-3480, “Environmental Instructions for Facilities, Materials and Equipment”
- Any other event deemed potentially reportable.

11.1.2 Events Requiring Cold Test Pit Evacuation or Emergency Response Organization Response

Some events that could occur at the project or the RWMC may require support from the RWMC ERO or may require a local area evacuation of the project. In these cases, the project field team leader,

subcontract technical representative, or project designee, who is the appointed project area warden, will immediately notify the RWMC shift supervisor, the WCC, cold test pit subcontractors, the WAG 7 manager of projects (who will notify DOE), and other appropriate parties as listed in Section 11.8. The notification will describe the event and request emergency response resources, as appropriate. After being informed of the event, the emergency coordinator may elect to activate the RWMC command post. Once the command post is declared operational, all emergency response activities will be coordinated through the emergency coordinator. The specific actions to be taken in response to emergency alarms are described in Section 11.5. Examples of these types of events include, but are not limited to, those listed below:

- A fire that is burning beyond an incipient stage and requires a response from the INEEL Fire Department to mitigate
- A large spill at the project that cannot be immediately contained or controlled
- A serious injury or rescue of a worker or workers.

11.1.3 Events Requiring Radioactive Waste Management Complex and Cold Test Pit Evacuation

No credible scenarios could or would result in the total evacuation of the RWMC from a cold test pit emergency event. In the event that an RWMC emergency requires evacuation of the cold test pits, the field team leader, subcontract technical representative, or project designee will be notified by the ERO to evacuate all cold test pit personnel. The RWMC emergency coordinator will be responsible for ordering a total area evacuation protective action that may include the cold test pit areas.

Note: *When an evacuation is called for by the emergency coordinator, the field team leader, subcontract technical representative, or project designee will be the designated project area warden who will ensure that the ERO personnel accountability leader has been notified that all cold test pit workers have been evacuated and personnel accountability has been completed.*

11.2 Emergency Facilities and Equipment

Emergency response equipment that is maintained at the cold test pits includes the items described in Table 9. Addendum 3 to the INEEL Emergency Plan lists emergency equipment available at the RWMC. This includes the command post located in Building WMF-637, equipment located in Building WMF-601 (i.e., self-contained breathing apparatus [SCBA] dosimeters, air samplers, decontamination, first-aid equipment), and an emergency response trailer. The INEEL Fire Department maintains an emergency HAZMAT response van that can be used to respond to an event or emergency at the cold test pits. Fire department personnel are also trained to provide immediate HAZMAT spills, rescue, and medical services. At least two people with current medic or first-aid training will be present at the cold test pits during all work activities (except cold test pit area monitoring and surveillance) to render first aid, as required. The cold test pit HSO and industrial hygiene personnel may assist with emergency decontamination efforts. Emergency equipment requirements relative to project-specific tasks beyond normal cold test pit maintenance and operations activities will be addressed in appendixes to this HASP and will be incorporated as these tasks are identified.

Table 9. Emergency response equipment to be maintained at the task site.

| Equipment Name and Quantity Required | Location at Task Site | Responsible Person | Frequency of Inspection |
|--|--|---------------------------------|-----------------------------------|
| Fire extinguishers | Located throughout the cold test pit areas and on all fueled equipment | Health and safety officer (HSO) | Monthly |
| First-aid kit | Administration area | HSO | Monthly |
| Eyewash bottles ^a | Administration area | HSO | Monthly |
| Eyewash station ^a | Administration area | HSO | Monthly |
| Hazardous materials spill kit ^b | Administration area | HSO | Monthly |
| Communication equipment available | Onsite | Field team leader | Availability and functional check |

a. Eyewash bottles, stored in the administration area, will be used in the control zone, when required, to provide an immediate eye flush. An eyewash station that meets the American National Standards Institute Z 358.1-1990 requirements is available in the administration area and will be moved to the control zone, when required.

b. The spill kit is stored in the administration area and will be moved to the control zone, when required.

11.3 Emergency Communications

In the event of an emergency, the capability to summon INEEL emergency response resources, to immediately notify site personnel, and to inform others of site emergencies is required.

Communications equipment at the task site will be a combination of pagers, radios, and telephones (e.g., mobile, cellular, or land lines).

The following actions, as necessary, will be taken for emergency situations:

- Call 777, the INEEL site emergency telephone number or 526-1515, the WCC. Once the initial call is made, the field team leader, subcontract technical representative, project designee, or HSO may use the E-NET radio to update emergency response personnel.
- Notify site personnel to evacuate to the designated marshalling or take-cover area by use of verbal communications, radios, cell phones, or a hand-held air horn with intermittent blasts.
- Notify site personnel to take cover using a continuous blast of the air horn.
- Contact the RWMC shift supervisor or facility manager by radio or telephone
- The RWMC shift supervisor will contact the RWMC ERO

Site personnel should provide the following information, as available, when communicating emergency information to the INEEL site emergency telephone number, the WCC, or the point of contact:

- The caller's name, telephone number, radio call sign, and pager number

- Exact location of the emergency
- Nature of the emergency, including time of occurrence, current site conditions, and special hazards in the area
- Injuries, if any, including number of injured, types of injuries, conditions of injured
- Additional information, as requested

11.4 Emergency Response Roles and Responsibilities

11.4.1 Emergency Response Organizations

The INEEL ERO structure is based on the incident command system. The incident command system is an emergency management system designed for use from the time an incident occurs and will be responded to until it is terminated. The system consists of procedures for controlling personnel, facilities, equipment, and communications. It allows for activating emergency response resources in a graded approach depending on the nature and seriousness of the event. At the cold test pits, the incident command system is implemented as a chain of command operating on three basic levels: (1) the on-scene commander, (2) the RWMC command post, and (3) the INEEL Emergency Operations Center.

11.4.1.1 On-Scene Commander. The on-scene commander (as specified in PLN-114) has the tactical and command responsibility for the control of an emergency situation at the scene, a fire, HAZMAT response, and as a special rescue response. The senior fire department officer responding for the INEEL Fire Department fills this position. If the event is primarily a security incident, the senior responding protective forces officer will assume the duties of the on-scene commander. In some instances, the incident response team leader may function as the on-scene commander until relieved by a higher-tiered authority. The incident response team leader reports to the on-scene commander who reports to the emergency coordinator. The incident response team acts at the first responder awareness level by providing initial-control personal-protective measures and incident assessment and mitigation, as directed by the incident response team leader.

The project field team leader, subcontract technical representative, project designee, and will be trained at the first responder awareness level and will:

- Understand the potential outcomes associated with an emergency when hazardous substances are present
- Understand what hazardous substances are and their associated risks in an incident
- Recognize the presence of hazardous substances in an emergency
- Identify the hazardous substances, if possible
- Assume the roles of a first responder at the awareness level
- Realize and understand the need for additional resources

11.4.1.2 Radioactive Waste Management Complex Command Post. The RWMC command post is the second tier of the emergency response line organization and will be headed by the emergency coordinator. The emergency coordinator will be responsible for all emergency response actions within the

entire facility including advising the on-scene commander. The command post will be activated for actual or potential emergencies or at the direction of the emergency coordinator. If the command post is activated in response to an event at the project, then the project will send a representative to the command post to advise the emergency coordinator.

11.4.1.3 Emergency Operations Center. The Emergency Operations Center is the upper tier of the ERO and is headed by the INEEL emergency director. The emergency director will be responsible for all emergency response actions at the INEEL including advising the emergency coordinator. Cold test pit personnel do not normally provide direct support to the Emergency Operations Center.

11.4.2 Project Personnel Involved in Emergencies

11.4.2.1 Field Team Leader, Subcontract Technical Representative, or Project Designee. The field team leader, subcontract technical representative, project designee, or the HSO will be responsible as the designated project first responder at the awareness level for initiating all requests for emergency services (e.g., fire and medical) and for notifying the facility shift supervisor of abnormal or potential abnormal events occurring on the project. The field team leader, subcontract technical representative, or project designee serves as the project area warden. In this capacity, the field team leader, subcontract technical representative, or project designee will report the accountability for all employees to the personnel accountability leader when an emergency evacuation is called. In addition, the field team leader, subcontract technical representative, or project designee will control the scene at the first responder awareness level until relieved by a higher-tiered incident command system authority at the scene to take control as the on-scene commander. While maintaining control of the scene from a protected and controlled distance, the field team leader, subcontract technical representative, or project designee will maintain communication with the facility shift supervisor or the emergency coordinator when the emergency communication system is in place.

11.4.2.2 Project Personnel. Every person at the project has a role to play during an event or INEEL emergency. Each employee must be constantly aware of potential problems or unexpectedly hazardous situations by immediately reporting these situations to the field team leader, subcontract technical representative, project designee, or HSO. All employees are expected to watch out for their fellow workers; to report their concerns to the field team leader, subcontract technical representative, or project designee; and to respond to emergency events as provided for in this HASP. Specific project personnel responsibilities are outlined in Table 10.

11.5 Emergencies, Recognition of Warnings, and Response

11.5.1 Emergency Recognition and Response

All task-site personnel should be constantly alert for signs of potentially hazardous situations, including signs and symptoms of chemical exposures or equipment failure or collapse. All personnel entering the cold test pit areas will be trained on the methods, signals, and alarms used to convey “EVACUATION” and “TAKE COVER” and on the expected responses. Cold test pit personnel will also be trained (during the training for this HASP) on the following immediate response actions:

- Assembling task-site personnel at the designated assembly point of the RWMC for an evacuation of the cold test pits
- Summoning the INEEL emergency response by calling 777 (INEEL site emergency telephone number) or the WCC at 526-1515

Table 10. Responsibilities during an emergency.

| Responsible Person | Action assigned |
|---|--|
| Field team leader, subcontract technical representative or project designee | <p>Contact the Radioactive Waste Management Complex (RWMC) shift supervisor or emergency coordinator (if command post has formed) OR</p> <p>Contact the Site Emergency Telephone or Warning Communications Center (if RWMC shift supervisor cannot be contacted)</p> <p>Contact ICP point of contact or ICP pager (4904)</p> <p>Contact Waste Area Group (WAG) 7 manager of projects</p> <p>Act as point of contact</p> <p>Conduct accountability and report information to the RWMC shift supervisor or personnel accountability leader</p> <p>Contact supervisors of injured personnel</p> |
| WAG 7 manager of projects | <p>Contact the vice president of Environmental Management</p> <p>Contact U.S. Department of Energy Idaho Operations Office ICP program counterpart</p> |
| Any project worker | Signal evacuation or take-cover for cold test pits project site emergency event |
| Any extinguisher-trained project worker | Extinguish fires (incipient stage fires only) |
| Any project worker | Contain spills (within level of training) |
| Medic first-aid-trained personnel | Provide first aid within level of training |
| Health and safety officer | Accompany injured personnel to the Occupational Medical Program |
| Supervisors of injured personnel | Accompany injured personnel to the Occupational Medical Program |

- Ensuring medic- or first-aid-trained individuals are available to provide care during accidents resulting in injury and reporting any injury that requires transportation by ambulance to a medical facility by calling 777 or 526-1515
- Ensuring task-site personnel extinguish any incipient fires using hand-held extinguishers and immediately reporting all fires by calling 777 or 526-1515
- Ensuring cold test pit personnel limit exposure to hazardous conditions in cases of hazardous material spills by following and not exceeding the limitations of their training and qualification for HAZWOPER, summoning INEEL emergency response for large spills by calling 777 or 526-1515, and immediately contacting the environmental affairs spill response categorization and notification team for all spills (via Pager No. 6400)
- If spills are small enough to be safely contained at the cold test pits, spill control will be handled by task-site personnel, who will take the following immediate spill-response actions:
 - Evacuating and isolating the immediate area
 - Seeking help from and warning others in the area

- Stopping the spill, if it can be done without risk (e.g., returning the container to the upright position, closing valve, shutting off power)
- Providing pertinent information to the field team leader, subcontract technical representative, and the HSO
- Securing any ventilation paths and ensuring that the industrial hygienist or safety engineer surveys the area to determine the extent of a chemical spill, as appropriate.

Emergency drills will be conducted relative to project-specific tasks beyond normal cold test pit maintenance and operations activities, and will be addressed in appendixes to this HASP, which will be incorporated as these tasks are identified. The purpose of these drills will be to familiarize employees with their respective emergency response actions. Any radio or telephone communications that are included in drills will be immediately preceded and followed with a statement that “This is a drill” to prevent an actual emergency response from being initiated by WCC. Each drill or actual emergency at the cold test pits will be followed by a critique and any identified deficiencies in the emergency plan will be corrected.

11.5.2 Alarms

Alarms and signals are used at the cold test pits and INEEL to notify personnel of abnormal conditions that require a specific response. Responses to these alarms are addressed in the general employee training. In addition to the alarms previously described, emergency sirens located throughout the RWMC serve as the primary means for signaling emergency TAKE COVER or EVACUATION protective actions. To signal site personnel of a project-initiated emergency event, emergency signals have been established based on using hand-held air or vehicle horns. These signals are described in Table 11.

Table 11. Project internal and backup emergency air-horn signals.

| Device or Communication Method | Signal | Associated Response |
|--------------------------------|--|--|
| Air horns (blasts) | One continuous blast | Take cover. |
| | Multiple short blasts (until all personnel react and begin evacuation) | Local area evacuation. Leave immediate work area and proceed to project assembly area. |
| | Three long blasts | Return to site—all clear. |

11.5.2.1 Take Cover. Emergency conditions may require that all personnel take cover in the nearest building. A TAKE COVER protective action may be initiated as part of a broader response to an emergency situation and may precede an evacuation order. The order to TAKE COVER is usually announced by activating a hand-held air horn. The signal to take cover will be a continuous blast that can be heard throughout the cold test pit areas. Remember, **STEADY = STAY** at the cold test pits. But the order to TAKE COVER can also be given by word of mouth, radio, or voice paging system. When ordered to TAKE COVER, project personnel will place the site in a safe condition (as appropriate) and then seek shelter in the project support or cold test pit administration trailer. Vehicles may be used for shelter if there are no buildings nearby. Eating, drinking, and smoking are not permitted during TAKE COVER conditions.

11.5.2.2 Total Area Evacuation. A total area evacuation is the complete withdrawal of personnel from the project site and the entire RWMC area. The evacuation signal is an ALTERNATING SIREN that can be heard throughout the RWMC. Remember, **ALTERNATE = EVACUATE**. However, the order to evacuate can also be given by word of mouth, radio, or voice paging system. When ordered to EVACUATE, project personnel will place the cold test pit area in a safe condition (as appropriate) and then proceed along the specified evacuation route to the designated assembly area (WMF-637) or as directed by the emergency coordinator.

For total area evacuations, the RWMC command post is activated and all personnel gather at the primary RWMC evacuation assembly area or the location designated by the emergency coordinator. Following a project evacuation, the field team leader, subcontract technical representative, or project designee will conduct accountability and report the results to the identified RWMC personnel accountability leader or RWMC emergency coordinator.

11.5.2.3 Local Area Evacuation. A local area evacuation will be the complete withdrawal of personnel from a project control zone, but it does not require the complete evacuation of the entire cold test pit areas. The order to evacuate can be given by word of mouth, radio, or voice paging system. When ordered to evacuate the local area, project personnel will place the project site in a safe condition (as appropriate) and then proceed along the specified evacuation route to the assembly area designated for local area evacuations or as directed by the field team leader or subcontract technical representative. Eating, drinking, and smoking are not permitted during emergency evacuations.

11.5.3 Personnel Accountability and Area Warden

Project personnel are required to evacuate the site in response to TAKE COVER and LOCAL AREA EVACUATION alarms. In each case, the project area warden will account for the people present on the site at the time the alarm was initiated. The field team leader, subcontract technical representative, or project designee serves as the area warden for the project and completes the personnel accountability based on the sign-in roster used to control site access. As described next, the method used to report the results of the accountability process varies depending on the nature of the emergency event.

For total area evacuations, the RWMC command post will be activated and all personnel will gather at the evacuation assembly area designated by the emergency coordinator. In this situation, the project area warden reports the results of the accountability process to the RWMC personnel accountability leader.

The RWMC command post will also be activated for TAKE COVER alarms; however, personnel remain in the closest appropriate shelter. In this situation, a complete personnel accountability report will not be required, but the cold test pit area warden should report the results of the accountability process to the RWMC command post or shift supervisor.

The RWMC command post is not usually activated for a cold test pit local area evacuation. In this situation, a complete personnel accountability report will not be required, but the project area warden should report the results of the accountability process to the RWMC shift supervisor who will provide the information to the RWMC facility manager.

11.5.4 Notifications

As directed by the office of the Secretary of Energy, the RWMC area director will be responsible for immediately notifying the DOE and local agencies off-Site of all significant abnormal events that occur at the cold test pits. This duty will be in addition to the notification requirements established in INEEL procedures for events that are categorized as emergencies or unusual occurrences. For this reason,

the project field team leader, subcontract technical representative, or project designee will immediately report all abnormal events that occur on the site to the RWMC shift supervisor and to the WCC. The WCC will, in turn, notify the appropriate INEEL emergency response resources and other INEEL facilities. The RWMC shift supervisor and the WCC share the responsibility for notifying the RWMC facility manager, emergency coordinator, and area director, as appropriate. The field team leader, subcontract technical representative, or project designee may make additional notifications (as listed in Section 11.8) at the discretion of the project supervision.

The emergency coordinator will be the single point of contact between the project and the INEEL ERO and off-Site people or agencies. The emergency coordinator will make all off-Site notifications. The cold test pits notification responsibilities are listed in Table 12.

Table 12. Cold test pit notification responsibilities.

| Responsible Person or Organization | | Phone | Pager | Radio |
|--|---|----------|-------|---------|
| Field team leader, subcontract technical representative, project designee, or any task-site personnel | INEEL emergency response telephone number | 777 | — | KOK 130 |
| Field team leader, subcontract technical representative, or project designee | Warning Communications Center | 526-1515 | — | KID 240 |
| Field team leader, subcontract technical representative, or project designee | INEEL spill notification team for spills | — | 6400 | — |
| Field team leader, subcontract technical representative, or project designee | RWMC shift supervisor | 526-2767 | 4428 | — |
| Field team leader, subcontract technical representative, or project designee | WAG 7 manager of projects | 526-3029 | 6451 | — |
| WAG 7 manager of projects | ICP manager of projects | — | — | — |
| WAG 7 manager of projects | DOE-ID manager, ICP | — | — | — |
| WAG 7 manager of projects | RWMC environment, safety, health, and radiological controls manager | 526-5706 | 5865 | — |
| RWMC shift supervisor | RWMC site area director or landlord | 526-4223 | 5270 | — |
| DOE-ID = U.S. Department of Energy Idaho Operations Office ICP = Idaho Completion Project INEEL = Idaho National Engineering and Environmental Laboratory RWMC = Radioactive Waste Management Complex WAG - waste area group | | | | |

11.5.5 Evacuation Routes

Primary and secondary evacuation routes are maintained for the cold test pits, as shown in Figure 6. These routes may be used in response to a total cold test pit area evacuation, as directed by the emergency coordinator. Copies of the evacuation routes will be posted at project-specific sites and in the cold test pit general administrative trailers for the cold test pits.

If the cold test pit sites are evacuated, personnel will assemble in the RWMC operations control building or as directed by the field team leader, subcontract technical representative, or project designee. If a total area evacuation of the RWMC is ordered, then project personnel will relocate to the primary evacuation assembly area at the RWMC or as directed by the emergency coordinator.

11.6 Reentry and Recovery

11.6.1 Reentry

During or following an emergency response, it is sometimes necessary to reenter the scene of the event. Reasons for performing a reentry may include the following:

- Performing personnel search and rescue
- Responding to medic and first-aid needs
- Performing safe shutdown actions
- Addressing mitigating actions
- Evaluating and preparing damage reports
- Performing radiation and HAZMAT surveys.

Reentries will be carefully planned to ensure that personnel are protected from harm and to prevent initiating another emergency event. Reentry planning will be undertaken as a graded approach, depending on the nature of the initiating event.

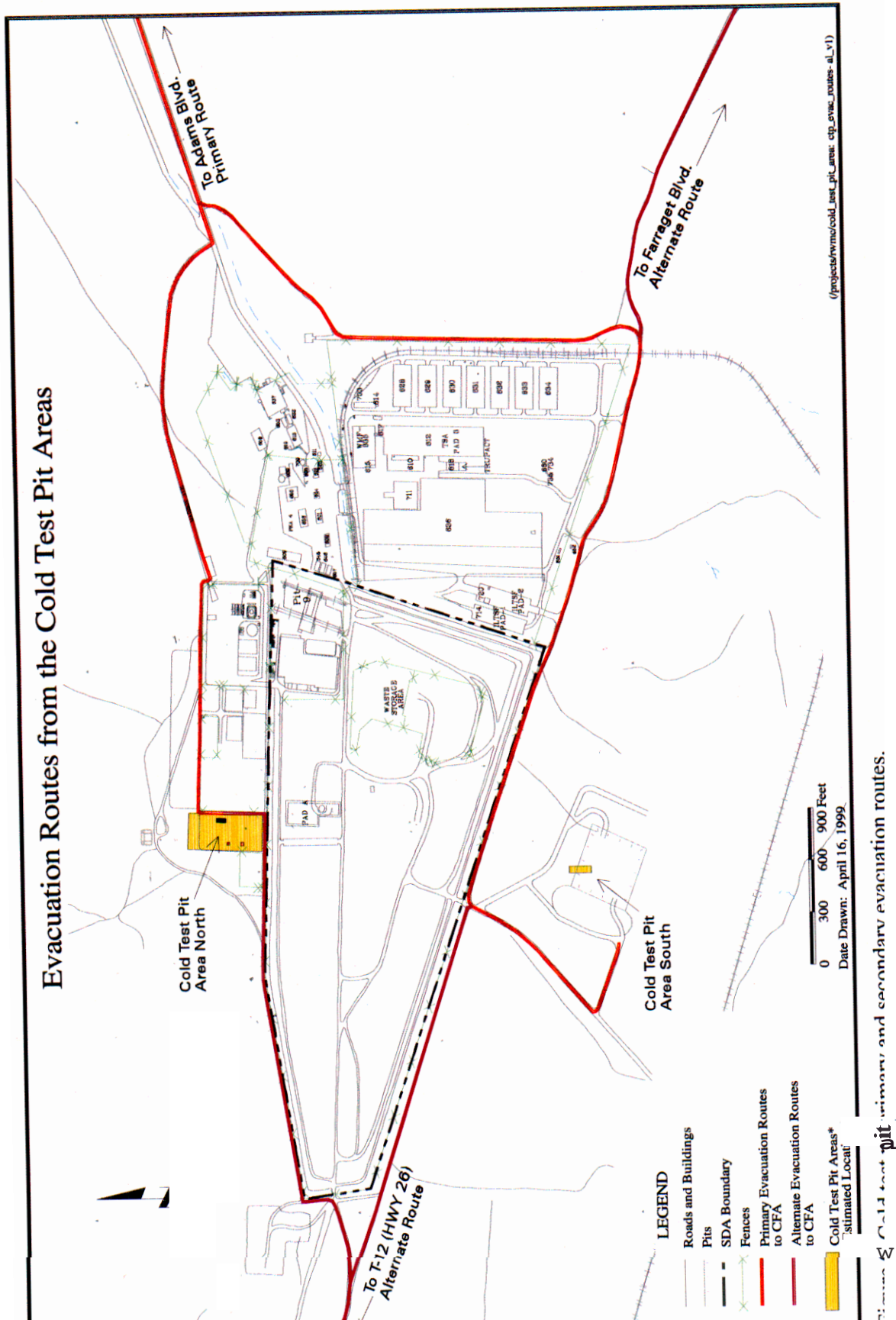
11.6.2 Recovery

After the initial corrective actions have been taken and effective control established, response efforts will shift toward recovery. Recovery is the process of assessing post-event or emergency conditions and developing a plan for returning to pre-event or pre-emergency conditions, when possible, and following the plan to completion. The emergency coordinator will be responsible for determining when an emergency situation is sufficiently stable enough to terminate the emergency and enter the recovery phase. The RWMC facility manager will appoint the recovery manager.

11.7 Critique of Response and Follow-Up

A review and critique will be conducted following all emergency events, drills, and exercises at the INEEL. In some cases, an investigation may be required prior to commencing recovery actions. For this reason, care should be exercised to preserve evidence, when appropriate.

Evacuation Routes from the Cold Test Pit Areas



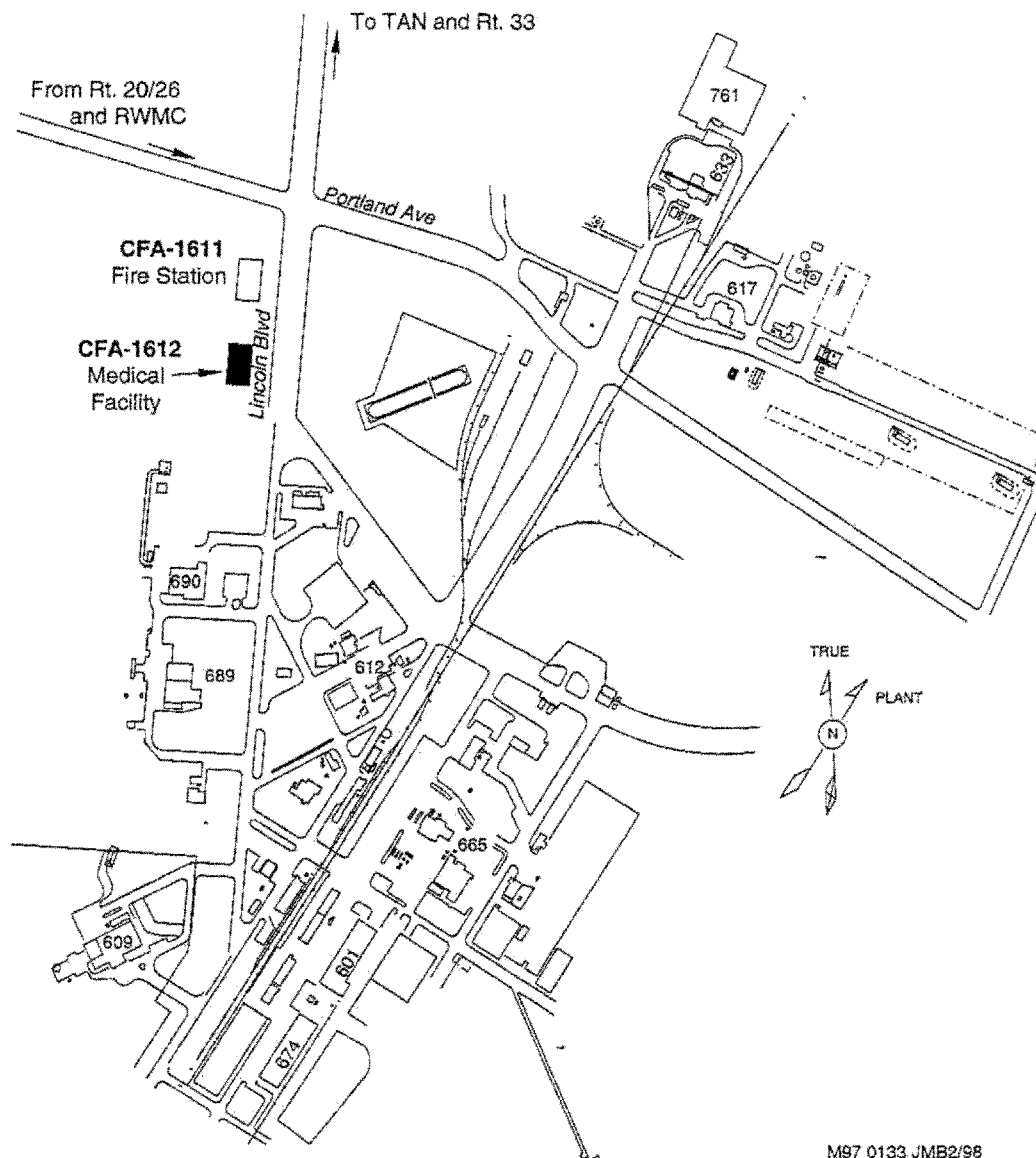
11.8 Telephone and Radio Contact Reference List

The points of contact for normal operations at the cold test pits are listed in Table 13. Point of contact lists relative to project-specific tasks beyond normal cold test pit maintenance and operations activities will be addressed in appendixes to this HASP, which will be incorporated as these tasks are identified. These lists will be posted at the entrance to the project-specific control zones and in the general administrative and project-specific site offices for the cold test pits.

A map showing the route to the nearest medical facility, locations of nearby INEEL fire stations, site and facility evacuation routes, and evacuation pickup locations is provided in Figure 7.

Table 13. Project emergency point of contact list.

| Contact Title | Contact Name | Phone Number or Radio Net | Pager Number |
|--|---------------------|-----------------------------------|-----------------|
| Warning Communications Center | — | 777 or 526-1515 Radio: KID-240 | — |
| RWMC shift supervisor | — | 526-2767 | — |
| RWMC nuclear facility operations | Albert E. Millhouse | 526-6932 | 5304 |
| RWMC operations director | David M. Bright | 526-4223 | 5270 |
| Operational medical program | — | 526-1596 | — |
| First aid (Central Facilities Area medical facility, CFA-1612) | — | 777, or 526-2356 | — |
| Fire and security | — | 777 | — |
| WAG 7 manager of projects | John M. Schaffer | 526-3029 | 6451 |
| RWMC environment, safety, health, and radiological controls manager | Randy Sayer | 526-5706 | 5865 |
| ICP environmental compliance officer | Brent N. Burton | 526-8695 | 7486 |
| RWMC safety engineer | James F. O'Brien | 526-5179 | 6447 |
| RWMC radiological control engineer | Thayne C. Butikofer | 526-7873 | 3296 |
| RWMC industrial hygiene | Brian M. Perkes | 526-9358 | 6355 |
| RWMC emergency planner | Silas Versage | 526-5130 | 6312 |
| RWMC quality engineer | Brian Chesnovar | 526-1435 | 3326 |
| WAG 7 radiological control engineer | W. Rick Horne | 526-5318 | 5898 |
| WAG 7 industrial hygiene | Lance Gurney | 526-3600 | 3531 |
| WAG 7 safety engineer | Kelly A. Wooley | 526-2552 | 7368 |
| WAG 7 cold test pit field team leader | Richard Jones | 526-1454 | 7914 |
| RWMC = Radioactive Waste Management Complex | | | |
| ICP = Idaho Completion Project | | | |
| WAG = Waste Area Group | | | |



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Figure 7. Map showing the route to the nearest medical facility (Central Facilities Area-1612).

12. REFERENCES

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Appendix A

Innovative Subsurface Stabilization Project Permeameter Removal Activity at Cold Test Pit South

Appendix A

Innovative Subsurface Stabilization Project Permeameter Removal Activity at Cold Test Pit South

This task has been completed.

Appendix B

OU 7-10 Glovebox Excavator Method Project Mockup at Cold Test Pit South

Appendix B

OU 7-10 Glovebox Excavator Method Project Mockup at Cold Test Pit South

B-1. INTRODUCTION

The 1993 Pit 9 Record of Decision (ROD) (DOE-ID 1993) required the removal and treatment of transuranic contaminated waste within the Pit 9 area. A 1998 Explanation of Significant Differences (DOE-ID 1998) to the Pit 9 ROD defined a three-stage approach to the remediation. Stage II is a retrieval demonstration effort that includes excavation of soils and waste from a 6 x 6-m (20 x 20-ft) area in Pit 9 (INEEL 2001). Pit 9 is located in the Subsurface Disposal Area (SDA) of the Radioactive Waste Management Complex (RWMC) of the Idaho National Engineering and Environmental Laboratory (INEEL) and was designated Operable Unit (OU) 7-10 under the Federal Facility Agreement and Consent Order (DOE-ID 1991) and the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) (42 USC § 9601 et seq.). On April 18, 2002, an Agreement to Resolve Disputes was reached between the U.S. Department of Energy (DOE), the Idaho Department of Environmental Quality (IDEQ), and U.S. Environmental Protection Agency (EPA), which established the Pit 9 schedule and activities for the three stages (DOE 2002).

The initial Stage II design, developed through collaboration between the U.S. Department of Energy Idaho Operations Office (DOE-ID), IDEQ, and EPA was a complex design that incorporated methodical waste retrieval and precise recovery processes including in situ characterization data-control similar to that of an archaeological excavation. As a result of a study to find a safe, faster, and less costly means to conduct the Stage II retrieval demonstration (INEEL 2001), a simplified method, identified as the glovebox excavator method, was developed. The method incorporates a Retrieval Confinement Structure (RCS) located over the excavation site with multiple Packaging Glovebox Systems (PGSs) attached directly to the RCS that are fed by track-guided transfer carts. This method will be tested in a mockup assembled at Cold Test Pit South over the in situ grouting (ISG) test pit and other areas of the Cold Test Pit South as necessary to support the work over the ISG test pit. Cold Test Pit South is located south of the SDA in the RWMC. Figures 1, 2, and 3 of the main body of this document are maps of the INEEL, RWMC, and Cold Test Pit South showing the ISG test pit, respectively.

A standard backhoe will be used to excavate pit waste materials. The backhoe boom and stick will be housed inside the RCS, while the operator and other excavator components will be located outside the RCS. The entire system will be enclosed by a large fabric-skinned Weather Enclosure Structure (WES). The OU 7-10 personnel will perform a mockup of the Glovebox Excavator Method Project system at Cold Test Pit South over the ISG test pit to evaluate system design, equipment, operational procedures and techniques, operator training, and methods proposed relative to future work in Pit 9 in a nonradiological environment.

B-1.1 Purpose

This appendix establishes the minimum requirements to eliminate or minimize health and safety risks to personnel working on the OU 7-10 mockup project activities that will be performed at Cold Test Pit South. For information on the applicable requirements included in INEEL manuals and the Occupational Safety and Health Administration (OSHA) standard, 29 Code of Federal Regulations (CFR) 1910.120 and 1926.65, "Hazardous Waste Operations and Emergency Response (HAZWOPER)," see Section 1 of the main body of this document.

B-1.2 Scope

Mockup testing will involve the excavation and processing of soil and simulated waste and pit grouting operations in the ISG test pit at Cold Test Pit South. The mockup system will be set up over the ISG test pit inside the large yurt located at Cold Test Pit South (see Figure 3 in the main body of this document). The mockup tests will include the operation of a backhoe, backhoe end effectors, depth monitor, overburden soil sacks, simulated RCS and PGS systems, simulated Weather Enclosure Structure, grout operations equipment, and other equipment that may be determined as necessary by design engineering or operations personnel to evaluate the OU 7-10 Glovebox Excavator Method Project.

The objective of mockup testing is to address the performance and ability of system equipment and operations personnel to safely execute the OU 7-10 Glovebox Excavator Method Project. The information obtained will assist with design engineering, equipment evaluations, operational procedure development, and operator training. The mockup tests will be performed using the excavator and PGS as described in an internal INEEL report.^a The objectives include investigating the following:

- As-built drawings of the backhoe
- Soil sack manipulation
- JAW bucket and 55-gal drum interference
- Backhoe bucket and PGS transfer cart interference
- End effector and glove port interference
- End effector remote coupling
- Hydraulic line protection for end effectors
- Physical stops
- Visibility of the operator
- Excavation of the waste zone
- Navigating around and handling of Type A probes
- Application of absorbent
- Aggregate demolition
- Overburden soil sack manipulation
- Core sampling
- Grout equipment operations and pit grout demonstration

a. Preussner, Brian D., Bechtel BWXT Idaho, LLC, and Bruce P. Miller, Vortex Enterprises, 2002, "Mock-up Testing of the Backhoe and End Effectors for the OU 7-10 Glovebox Excavator Method Project," INEEL/INT-02-00724, Rev. 0, Idaho National Engineering and Environmental Laboratory, Idaho Falls, Idaho.

- Other tests necessary to evaluate the design, operation, or execution of the project such as PGS operations; waste segregation, sizing, and bag-out sampling; and drum filling, sealing, and changeout.

Construction of the mockup system including initial overburden removal, shoring box installation, and RCS and PGS construction may be subject to the requirements of this health and safety plan (HASP) as determined by the construction management STR and HSO in accordance with approved work controls.

B-1.3 Idaho National Engineering and Environmental Laboratory Site Description

For details on the location and operational history of the INEEL, see Section 1.1 of the main body of this document.

B-1.4 Site Description

The ISG test pit is contained in Cold Test Pit South—one of two cold test pits located near the SDA. All work described in this appendix will be completed at Cold Test Pit South. For details on the RWMC, the Subsurface Disposal Area (SDA), Cold Test Pit South, and the ISG test pit, see Section 1.2 and Figures 1, 2, and 3 of the main body of this document.

B-1.4.1 OU 7-10 Mockup Site Description

For mockup assembly and testing, the OU 7-10 mockup project will use the in situ grouting (ISG) simulated waste, test pit, and weather enclosure constructed at the Cold Test Pit South area. Mockup systems and equipment will be assembled over the existing ISG test pit location inside the weather enclosure currently in place over the ISG test pit (see Section 1.2.2.1 and Figure 3 of the main body of this document). Other project support equipment may be constructed and appropriate testing completed in other areas of the Cold Test Pit South as necessary to support the work over the ISG test pit.

At Pit 9, the OU 7-10 Glovebox Excavator Method Project will incorporate an RCS located over the excavation site that consists of a steel-framed, steel-paneled structure with windows. The Retrieval Confinement Structure will be located within a larger fabric-skinned Weather Enclosure Structure (WES). A PGS will attach directly to the confinement structure and will be fed by track-guided transfer carts.

A standard backhoe will be used to perform soil excavation, probe removal, 55-gal drum removal (employing a JAW bucket design), core sampling (employing a jackhammer/core sampler design), and grout hose manipulation. Hydraulic lines on the various backhoe end effectors will be coupled and uncoupled through the use of glove ports built into the 1.8-m(6-ft) RCS double access doors, while the end effectors will be attached and detached remotely through the use of a remote hydraulic coupler. Glove ports and a bag in/bag out port will be used to transfer core samples. The boom and stick of the excavator are to be housed inside the RCS, while the operator and other excavator components will be located outside the RCS and within the weather enclosure (see Figure B-1).

Construction of the OU 7-10 mockup retrieval system will be completed at the Cold Test Pit South area over the ISG test pit. The assembly will be constructed with enough physical detail to simulate operational conditions (as described above) sufficiently to provide adequate process, systems, operations, and procedural evaluation information to validate the glovebox excavator method system before use at Pit 9. The mockup also may be used to train personnel in addressing operational issues or unreviewed safety question items encountered in the actual Pit 9 excavation activity (INEEL 2002a, 2002b).

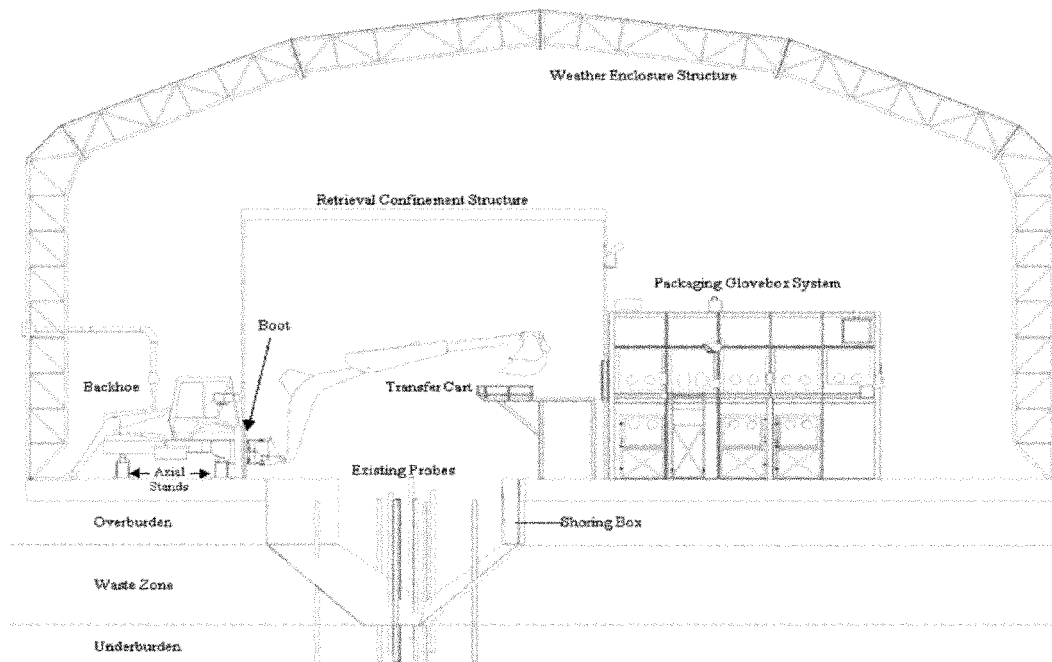


Figure B-1. Operable Unit 7-10 Glovebox Excavator Method Project

B-2. KEY SITE PERSONNEL REQUIREMENTS

For mockup construction activities at Cold Test Pit South, the organizational structure shown in Figure 5 of the main body of this document reflects the resources and expertise required to perform the work while minimizing risks to worker health and safety, the environment, and the general public. The figure identifies key positions at the site and the corresponding lines of authority and communications. Descriptions and responsibilities of the key site personnel are detailed in Section 2 of the main body of this document.

The project specific organizational structure for the OU 7-10 mockup excavation tests and operational training at the Cold Test Pit South are shown in Figure B-2. Descriptions and responsibilities of the key site personnel not previously detailed in Section 2 of the main body of this document are included below.

The OU 7-10 Facility Manager is the authorizing authority for all project operations and test activities proposed in the project plan of the day for implementation at the Cold Test Pit South. He serves as the facility manager for that portion of the Cold Test Pit South where project mockup activities will be conducted.

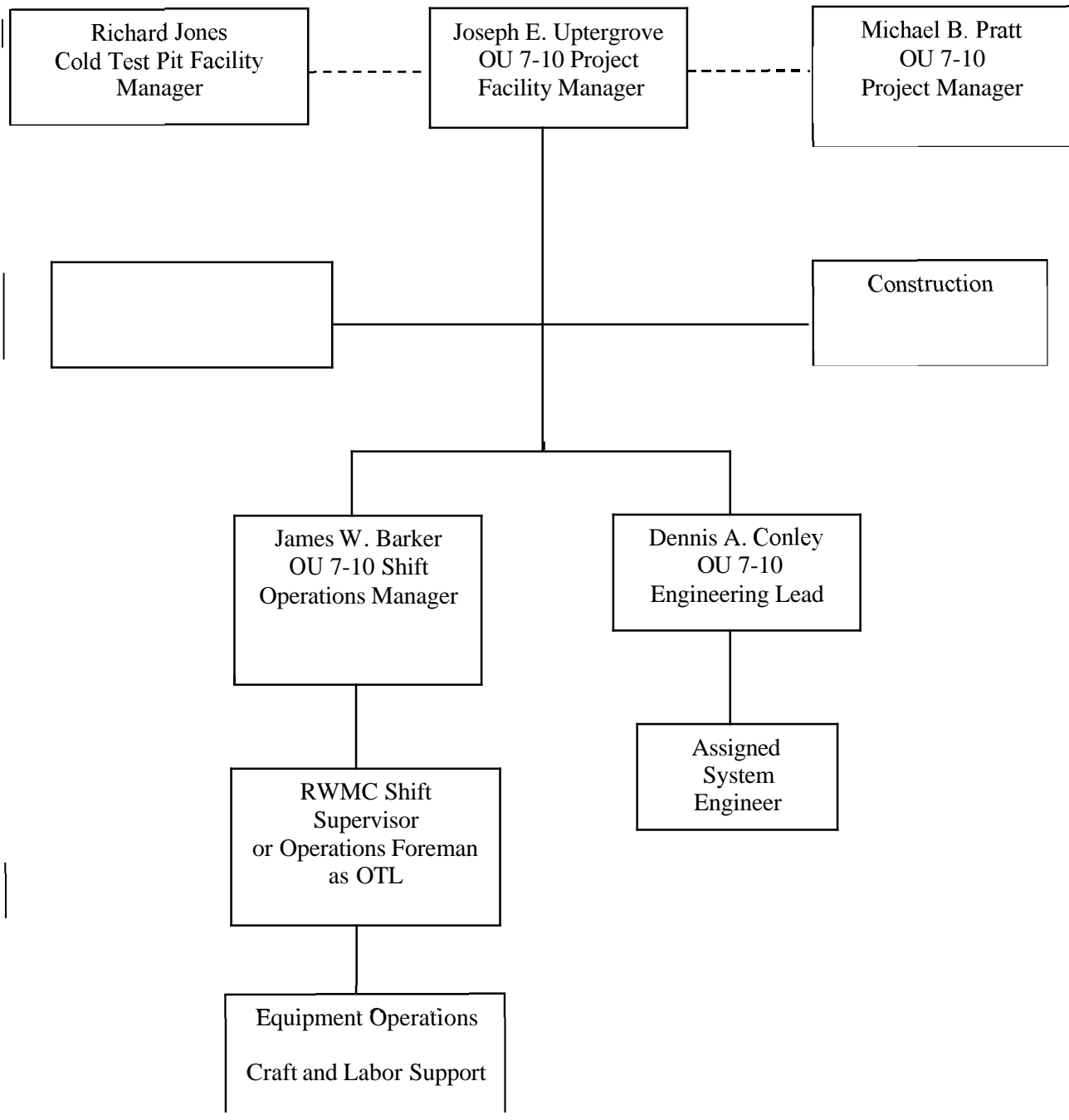


Figure B-2. Organization chart for OU 7-10 Glovebox Excavator Method Project excavator mockup test at Cold Test Pit South.

The OU 7-10 Shift Operations Manager will be responsible for all operations related to the OU 7-10 mockup. The shift operations manager will ensure all operations are performed in compliance with company policies and procedures. The shift operations manager ensures that all work is performed in compliance with the approved safety basis documents and that personnel are trained to perform the identified work in a safe, compliant manner. The OTL reports to the shift operations manager.

The Waste Area Group (WAG) 7 Cold Test Pit Facility Manager facilitates use of the INEEL Cold Test Pit South by WAG 7 projects and the OU 7-10 Glovebox Excavator Method Project for purposes of this mockup test. The facility manager is responsible for ensuring that all activities described in this appendix satisfy any special requirements governing the use of the Cold Test Pit South.

The OU 7-10 Operations Technical Lead (OTL) is the project designated field activity lead (project designee) representing the project at the test site with responsibility for the safe and successful completion of excavation and glovebox mockup testing. The OTL manages field activities and executes the technical procedures (TPRs) and other work controls. The OTL enforces task-site control, documents activities, and may conduct the daily safety briefings at the start of each daily shift. Health and safety issues will be brought to the attention of the OTL. The OTL will report to the OU 7-10 Shift Operations Manager and will work closely with the project mockup lead and lead test engineer to complete all testing.

The OU 7-10 Operations Engineering Lead will provide support and assistance to the test engineers for all pretest and test activities. These activities will include the test plan, test procedures, test execution, test results report, and coordination with the mockup lead. In addition, the engineering lead will assist with identifying the appropriate reviewers and approvers for all test documents. The OU 7-10 Operations Engineering Lead will serve as the point of contact with design engineering and project management for proposing any design changes resulting from mockup testing. The operations engineering lead will submit such proposed changes to the project engineer and project manager for review and approval. Such submittal will be done using the project Design Change Request form.

The health and safety officer (HSO) assigned to the task site serves as primary contact for health and safety issues and advises the OTL and TE on all aspects of health and safety. The HSO along with everyone at the job site is authorized to stop any and all work if any operation threatens worker safety or public health or safety. The HSO is authorized to verify compliance with this HASP and the hazard assessment document for OU 7-10 mockup test activities, to conduct inspections, and to require and monitor corrective actions as appropriate.

All heavy equipment operators will be appropriately qualified for the equipment to be operated. Craft and labor support will be used to prepare the OU 7-10 mockup test plan area and as needed during the tests. Craft and labor support personnel will take direction from the OTL either directly or through their respective foreman where support is needed during mockup tests. The TE will provide test direction via the OTL. When not working under mockup test plan work controls, craft and labor support will generally utilize STD-101, "Integrated Work Control Process," work packages to perform assigned tasks.

B-3. RECORD-KEEPING REQUIREMENTS

No site-specific changes from the main body of this document apply to safety and health record-keeping requirements. See Section 3 of the main body of this document for the general requirements for record keeping for this project.

B-4. PERSONNEL TRAINING

Training requirements for work completed in the cold test pits (including Cold Test Pit South) are addressed in Section 4 of the main body of this document and include required general training, visitor training requirements, training verification requirements, and training documentation requirements. Project-specific requirements are identified in Table B-1.

Table B-1. Required OU 7-10 mockup project-specific training.

| Training | OTL, STR, and Health and Safety Officer | Other Field Team Members (including samplers) | Non-Worker Access into the Contamination Reduction Zone | Support Zone Access Only |
|--|---|---|---|--------------------------|
| Project-specific HASP training ^a | Yes | Yes | Yes | — |
| Project-site orientation briefing ^b | — | — | Yes | Yes |
| Fire extinguisher training (or equivalent) | Yes ^c | Yes ^c | — | — |
| CPR, medic first aid | Yes ^e | Yes ^e | — | — |
| Respirator training (contingency only) | d | d | — | — |

Note: Shaded fields indicate specific training is not required/applicable. Nonworkers will not be permitted in the exclusion zone during active mockup activities.

a. Includes project-specific hazard communications, site-access and security, and decontamination and emergency response actions, as required by 29 CFR 1910.120(e).

b. Orientation includes briefing of site hazards, restricted and controlled areas, emergency response actions, and personal protective equipment requirements. Personnel receiving project-site orientation briefing only are limited to the support zone and must be escorted by fully HASP-trained project supervisor or designee.

c. At least one trained person should be onsite when work is taking place. The health and safety officer will determine appropriate number of personnel requiring training.

d. This training is required only if personnel are entering an area requiring respiratory protection (e.g., if action levels are exceeded, or industrial hygiene sampling shows respirators are required).

e. Two medic first-aid and cardiopulmonary resuscitation (CPR) -qualified individual must be present during all OU 7-10 project cold test pit activities.

CPR-cardiopulmonary resuscitation

HASP-health and safety plan

OTL-operations technical lead

STR-subcontract technical representative

B-5. OCCUPATIONAL MEDICAL SURVEILLANCE PROGRAM

Based on the existing site-specific information available for this project, no additional Occupational Medical Surveillance Program requirements in addition to those identified in the main body of this document apply to this section. The simulated waste being excavated contains chemical constituents described in Section B-8, but does not have the potential to trigger personnel participation in the INEEL Occupational Medical Surveillance Program. See Section 5 of the main body of this document for information about the Occupational Medical Surveillance Program requirements.

B-6. ACCIDENT PREVENTION PROGRAM

The activities addressed in this appendix will be performed under approved work control documentation prepared and authorized by the requirements in STD-101; MCP-3562, "Hazard Identification, Analyses, and Control of Operational Activities"; and MCP-3571, "Independent Hazard Review." See Section 6 of the main body of this document for information about accident prevention program requirements.

B-7. SITE CONTROL AND SECURITY

The HSO will be responsible for working with the industrial hygienist and safety engineer to establish the OU 7-10 mockup site boundaries. The HSO will establish control zones to simulate the zones to be used during the Pit 9 activities with consideration for minimizing personnel exposure to hazards at Cold Test Pit South. The work zones will be continually evaluated by the OTL or the HSO and adjusted as needed upon consultation with the industrial hygienist and safety engineer. Figure B-3 is a general map of possible zones that will be established at the mockup by the HSO in conjunction with input from safety and industrial hygiene.

B-7.4 Designated Eating and Smoking Area and Site Security

See Section 7 of the main body of this document for the requirements related to the OU 7-10 Glovebox Excavator Method Project mockup designated eating and smoking area and the site security requirements.

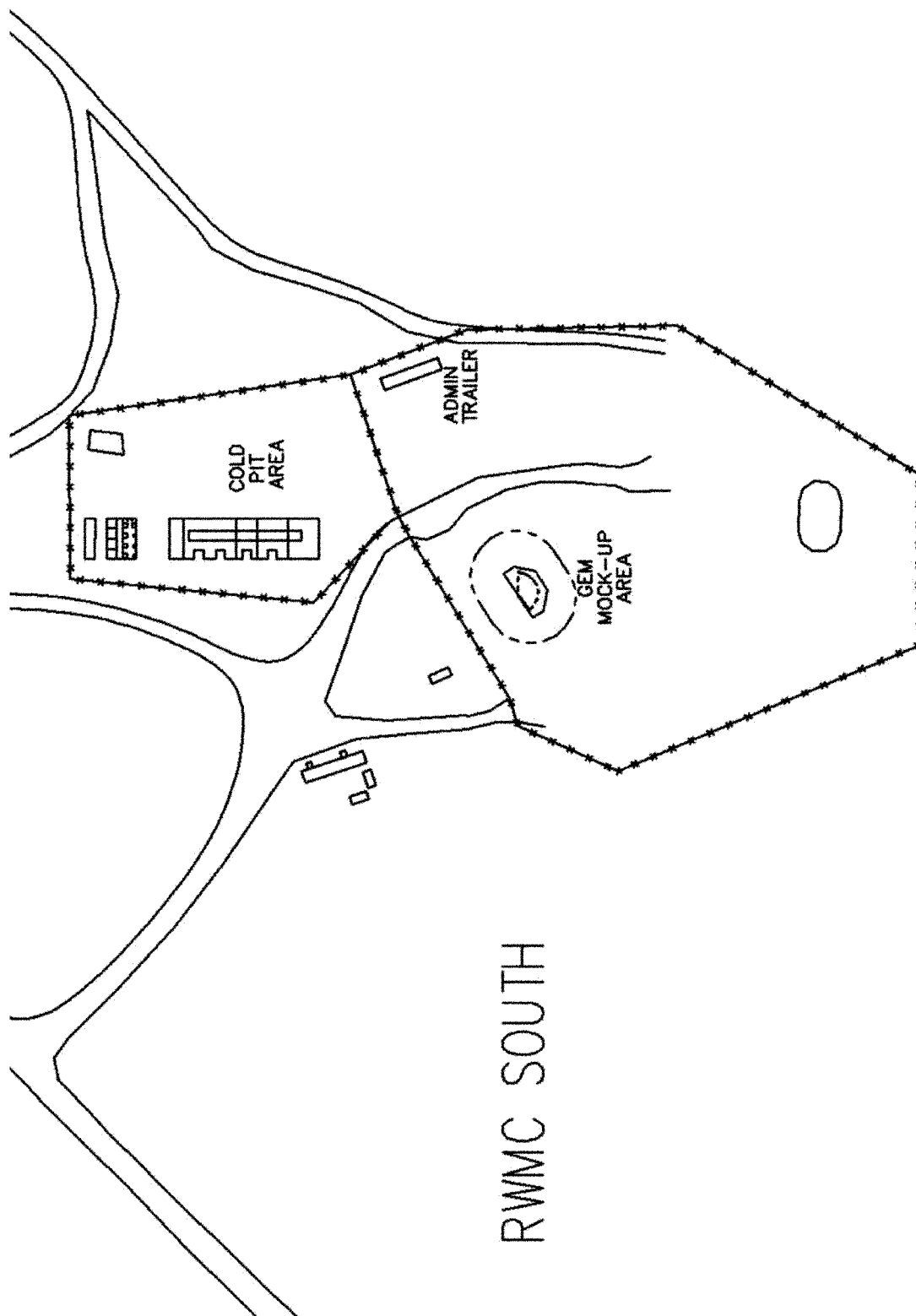


Figure B-3. General configuration of the OU 7-10 Glovebox Excavator Method Project mockup site at Cold Test Pit South

B-8. HAZARD EVALUATION

Section 8 of the main body of this document provides general information about the types of hazards that may be encountered while performing work at Cold Test Pit South. Applicable areas covered in Section 8 of this HASP include industrial hygiene exposure assessments, biological hazards, routes of exposure, industrial hygiene monitoring, temperature extremes, noise, fire or explosion hazards, confined spaces, excavation, material handling, powered equipment and tools, heavy equipment and machinery, Electrical and energized system hazards, personal protective equipment, and inclement weather.

B-8.1 Excavation, Surface Penetrations, and Outages

Excavation tasks will be required at Cold Test Pit South to excavate soil and simulated waste forms in the mockup construction area. No underground utilities are located in the ISG test pit area of Cold Test Pit South. A person competent in assessing excavations will be designated for all excavation tasks. The final elevation depth to the bottom of the pit is expected to be approximately 3 to 4.5 m (10 to 15 ft) below existing grade. All excavation activities will be conducted and monitored in accordance with PRD-22, "Excavation and Surface Penetration," and 29 CFR 1926, Subpart P, "Excavations." Some key elements of these requirements include the following:

- The mock-up floor structure and the shoring box provide protection from excavation sloughing. Personnel shall not be allowed into the pit unless evaluation is conducted by industrial safety and protective measures are established. As such, with the guardrail and barricades in place, the excavation activities will be routinely conducted from outside the pit and periodic evaluations of the excavation will be performed by an excavation competent person qualified industrial safety engineer. Soil classification for Cold Test Pit South soil is assumed to be Type C soil. If the excavation is not sloped on all sides, then unprotected sides or edges 1.8 m (6 ft) or more above a lower level will be protected from falling by the use of guardrail systems, safety net systems, personal fall-arrest systems, or restricted area or access locations (controlled access zones) established to prevent personnel access to the unprotected sides or edges. Personnel shall not enter the excavation area unless (1) it has been determined by a competent person to be safe with adequate slope (1.5 to 1), (2) access routes have been verified by the competent person in accordance with PRD-22 and (3) an evaluation of potential atmospheric hazards has been completed by the industrial hygienist.
- Other special hazards or controls: Fire extinguishers will be positioned inside the yurt structure during excavation activities as directed by the HSO and the fire protection engineer. The exhaust from the excavator used in the mockup will be passively or mechanically vented to the outside of the yurt structure. General dilution ventilation will be provided by either providing for passive air movement or by mechanically blowing fresh air into the yurt. The industrial hygienist will monitor, as appropriate, for CO buildup during equipment operation inside the yurt, and mitigative actions will be implemented based on the industrial hygienist's measurements and recommendations.

Specific hazards associated with the OU 7-10 mockup activities, as identified for this operation, are presented in this section.

B-8.2 Hazards Assessment

The specific simulated waste forms buried in the ISG test pit of Cold Test Pit South are summarized in Table B-2. The simulated waste originally placed in the ISG test pit has been removed and repositioned in the OU 7-10 mockup test pit. The test pit may not contain all of the wastes listed in

Tables B-2, B-3, and B-5. The hazards associated with these chemical constituents are identified in Table B-3. The project tasks, associated hazards, and appropriate mitigation are presented in Table B-4. The potential hazardous agents and the equipment available for sampling or monitoring of these agents, as determined appropriate by the industrial hygienist, are presented in Table B-5.

Table B-2. Simulated waste packages for the Cold Test Pit South in situ grouting pit.

| Waste Container Type | Number | Composition |
|---|--------|---|
| Cardboard boxes (4 x 4 x 8 ft) | 2 | Metal debris (i.e., 1/8-in. plate steel, tubing, piping, and scrap metal), concrete and asphalt chunks (6-in. size), and pulverized wood. Metal 38%, concrete and asphalt 37%, and pulverized wood 25% |
| Drums (55 gal) or sacks | 63 | As listed below |
| • Cardboard | 25 | Combustibles (i.e., cloth, paper, wood, and plastic) |
| • Cardboard | 13 | Inorganic sludge (enough water to create a paste-like consistency; 390 lb soil, 40 lb dry Portland cement, and 36 lb NaNO ₃) |
| • Cardboard (metal) | 6 | Organic sludge (38 gal of Texaco Regal Oil, 65 lb Micro Cell-E, and 35 lb kitty litter) |
| • Sacks (2 x 2 x 3 ft) (polyethylene) | 14 | Cloth and paper |

B-8.3 Other Site Hazards and Inspections

Task-site personnel should look continually for potential hazards and immediately inform the OTL or HSO so that action can be taken to correct a problematic condition. The HSO and OTL will inspect the site periodically to ensure that barriers and signs are being maintained, unsafe conditions are corrected, and debris is not accumulating on the site. These inspections will be conducted in addition to daily excavation inspections.

The OTL (or designee) will perform periodic safety inspections using an appropriate checklist in accordance with MCP-3449, “Safety and Health Inspections.” In addition, targeted or required self-assessments may be performed during mockup activities in accordance with MCP-8, “Self-Assessments Process for Continuous Improvement.” All inspections and assessments will be noted in the OTL logbook. Health and safety professionals present at the task site may, at any time, recommend changes in work habits to the OTL. However, all changes that may affect the project’s written work control documents (e.g., any technical procedures, work orders, this HASP, job safety analyses, and safe work permits) must have concurrence from the appropriate project technical discipline representative onsite and have a document action request prepared on Form 4 12.11, “Document Management Control system (DMCS) Document Action Request (DAR),” as required.

Table B-3. Evaluation of simulated waste materials buried in the in situ grouting test pit at Cold Test Pit South

| In Situ Grouting Test Pit Simulated Waste or Hazardous Material (Chemical Abstract Service number) | Exposure Limit ^a (PEL/TLV) | Routes of Exposure | Symptoms of Over Exposure ^b (Acute and Chronic) | Target Organs and Systems | Carcinogen (Source) ^c | Exposure Potential (Regardless of Personal Protective Equipment) |
|--|---|---|---|--|----------------------------------|--|
| Inorganic Compounds | | | | | | |
| CaSiO ₃ (cement) (1344-95-2) | TLV-10mg/m ³ (inhalable) 5 mg/m ³ (respirable) | Inhalation, ingestion, and contact hazard | Irritation eyes, skin, and upper respiratory system | Eyes, skin, respiratory system | No | Low |
| CO (630-08-0) Equipment operating inside weather structure | TLV-25 ppm OSHA TWA – 50 ppm | Inhalation | Headache, tachypnea, nausea, lassitude (weakness and exhaustion), dizziness, confusion, hallucinations; cyanosis; depressed S-T segment of electrocardiogram, angina, and syncope | Cardiovascular system, lungs, blood, CNS | No | Low to moderate |
| Clay, micro cell (12141-46-7) | None established | Inhalation, ingestion, and contact hazard | Irritation eyes, skin, respiratory system; cough | Eyes, respiratory system | No | Low |
| Diesel exhaust | TLV- 0.05 mg/m ³ (particulate aerodynamic diameter <1 µm (ACGIH 2000 notice of intended changes) | Inhalation | Respiratory irritation, nose, throat or lungs, with stinging and redness of the eyes, headache, nausea, dizziness, unconsciousness | Respiratory system | ACGIH – A2 | Moderate |
| Diesel fuel (8008-20-6) VD->1 | TLV 100mg/m ³ (ACGIH 2000 notice of intended changes) | Inhalation, skin absorption, and contact hazard | Eyes irritation, respiratory system changes, dermatitis | Eye and respiratory system | No | Moderate |

Table B-3. (continued)

| In Situ Grouting Test Pit Simulated Waste or Hazardous Material (Chemical Abstract Service number) | Exposure Limit" (PEL/TLV) | Routes of Exposure | Symptoms of Over Exposure ^b (Acute and Chronic) | Target Organs and Systems | Carcinogen (Source)" | Exposure Potential (Regardless of Personal Protective Equipment) |
|---|--|---|---|--|-------------------------|--|
| NO _x (nitrogen oxides) (Incomplete combustion by-product) equipment operating in weather structure | TLV – 3 ppm (NO _x) STEL – 5 ppm OSHA C – 5 ppm (NO ₂) | Inhalation | Irritation eyes, nose, throat; cough, mucoid frothy sputum, decreased pulmonary function, chronic bronchitis, dyspnea (breathing difficulty); chest pain; pulmonary edema, cyanosis, tachypnea, tachycardia | Eyes, respiratory system, and cardiovascular system | No | Low to moderate |
| Silica, crystalline – quartz (cement) (14808-60-7) | TLV-0.05 mg/m ³ (respirable fraction) OSHA PEL (Respirable) TWA 10 mg/m ³ /(%SiO ₂ + 2) Quartz (total dust): TWA 30 mg/m ³ / (%SiO ₂ + 2) | Inhalation and contact hazard | Pulmonary fibrosis and silicosis | Respiratory | ACGIH-A2 | Low |
| NaCl (7647-14-5) | None established | Inhalation, ingestion, and contact hazard | Eyes and irritation of mucous membranes | None identified— primarily a localized irritant | No | Low |
| Tb ₂ O ₃ | None established | Inhalation, contact hazard, and ingestion | Respiratory irritation, pulmonary fibrosis | Respiratory system | No | Low |
| Texaco Regal Oil | None established | Contact hazard | Irritation of skin and eyes | Local irritation for contact pathway | No | Low |

a. American Conference of Governmental Industrial Hygienists (ACGIH) 2001 Threshold Limit Value Booklet and Occupational Safety and Health (OSHA) 29 CFR 1910 substance specific standards.

b. Nervous system: dizziness, nausea, and lightheadedness. Dermis: rashes, itching, and redness. Respiratory: respiratory effects. Eyes: tearing and irritation.

c. If yes, identify agency and appropriate designation (ACGIH A1 or **A2**, National Institute for Occupational Safety and Health [NIOSH], OSHA, International Agency for Research on Cancer, National Toxicology Program).

VD = vapor density (Air = 1)
GI = gastrointestinal

C = ceiling value
PEL = permissible exposure limit

CNS = central nervous system
STEL = short term exposure limit

CVS = cardiovascular system
TLV = threshold limit value

TWA = time-weighted average

Material safety data sheets for these chemicals are available at the project site.

Table B-4. Project tasks, associated hazards, and mitigation.

| Tasks | Potential Hazards and Hazardous Agents | Hazard Elimination, Isolation, or Mitigation |
|---|---|--|
| <ul style="list-style-type: none"> • Site preparation • Equipment mobilization and demobilization • Equipment operation and evaluation as part of mockup testing • Excavation of simulated waste pit • Re-establishing the simulated waste and pit after excavation • Inspection, sorting, sizing, and sampling of excavated materials • Material staging, removal, and site restoration • Pit grouting demonstration | <ol style="list-style-type: none"> 1. Simulated waste material contact or exposure and other chemicals at the task site—direct contact with simulated waste materials (if not encapsulated by grouting operation), contact with grout material (high pH), equipment maintenance or leaks of fuels/lubricants, exposure to dust, and CO and NO, 2. Pinch points, caught-between, struck-by, and overhead hazards — quipment assembly and placement, vehicle or equipment movement, RCS and weather structure assembly and disassembly, excavation, simulated waste handling and sizing, and material handling 3. Lifting and back strain — handling equipment and materials, sorting, sampling, and handling simulated waste materials, and movement 4. Tripping hazards, uneven terrain, walking, and working surfaces — coldtest pit area, wet or muddy surfaces, equipment, cables and lines on the ground, and inside weather structure 5. Hoisting and rigging — positioning equipment at project site, forklift operation and RCS, glovebox, simulated waste pit, and weather structure assembly and disassembly 6. Heated surfaces, heat, and cold stress— equipment motors and exhaust surfaces; outdoor work; summer, fall, and winter temperatures; and PPE usage 7. Hazards noise levels — trucks, pumps, drill rig, heavy equipment, compressors, and hand tools 8. Energy sources—high-pressure lines and displacement pump; electrical, mechanical, thermal, and compressed air systems | <ol style="list-style-type: none"> 1. Establishing work zones to minimize personnel exposure. Using MSDS for all chemicals used. PPE as required to reduce skin contact and exposure to chemicals. Conducting exposure monitoring in accordance with M determination. Using engineering controls for equipment operation (exhaust and general dilution ventilation). Using water misting to reduce dust creation. PPE (as required). 2. Using qualified operators; using spotter and backup alarms; controlling work zone access; requiring personnel briefing on work area hazards; using body position awareness; donning hand, head, and body PPE as appropriate for activities; and using tag lines as determined necessary for hoisting and rigging activities. 3. Using mechanical lifting and movement devices for heavy or awkward materials. Using proper lifting techniques or two-person lifts (as required) for manual handling. Adjusting the workstation to reduce ergonomic stress. 4. Controlling access to work zones. Identifying and mitigating tripping hazards and marking where possible. Maintaining good housekeeping and keeping walkmg and working surfaces clean (where feasible). 5. Controlling access to work zones; using qualified operators and certified rigging and following PRD-160, “Hoisting and Rigging,” requirements; using tag lines; and imposing wind restrictions. 6. Controlling access to work zones. Identifying and labeling known heated surfaces where contact is possible. Conducting industrial hygiene monitoring and work-rest or warm-up cycles (as required). Donning proper selection of work clothmg or PPE. Conducting heat and cold stress personnel training. 7. CWA: conducting industrial hygiene sound-level monitoring and dosimetry for source identification; wearing hearing protection devices. 8. CWA and restricted areas: posting and labeling sources; using tie downs and whip checks; training; isolating energy sources (through lockout/tagout) for all maintenance activities; donning PPE. |
| <p>CWA = controlled work area PPE = personal protective equipment</p> | | <p>M = industrial hygiene RCS = Retrieval Confinement Structure MSDS = material safety data sheet PRD = program requirements document</p> |

Table B-5. Potential hazardous agents and sampling equipment.

| Chemical Hazard to Be Monitored or Sampled | Equipment and Monitoring/Sampling Method ^{a,b} | |
|---|---|---|
| Petroleum hydrocarbons and distillates Nuisance particulates, NOC (respirable) Crystalline silica (respirable) Diesel exhaust | Personal sampling pumps with appropriate media | Petroleum distillate—NIOSH 1550 Particulates, total nuisance (respirable)—NIOSH 0600 Crystalline silica (respirable)—NIOSH 7500 Diesel exhaust—NIOSH 5040 |
| Petroleum hydrocarbons (volatile organic compounds [VOCs]) | | FID, PID, or equivalent |
| CO, NO ₂ | MSA-361 or equivalent, with CO and NO ₂ cells | |
| Hazardous noise levels (>85 dBA for an 8-hour workday, 83 dBA for a 10-hour day, >140-dBA impact) | ANSI Type S2A sound level meter and ANSI S1.25-1991 dosimeter (A-weighted scale for TWA dosimetry, C-weighted for impact dominant sound environments) | |
| Heat and cold stress | Heat stress—WBGT, body | Cold stress—ambient air temperature, |
| | weight, fluid intake | wind chill charts |

a. Air sampling will be conducted as deemed appropriate by project industrial hygiene personnel based on initial direct reading instrument data, operation, and professional judgment.

b. Analytical method will be selected by the industrial hygiene based on site-specific conditions

ANSI = American National Standards Institute
 FID = flame ionization detector
 NOC = not otherwise classified
 TWA = time-weighted average
 WBGT = wet bulb globe temperature

dBA = decibel A-weighted
 NIOSH = National Institute of Occupational Safety and Health
 PID = photoionization detector
 VOC = volatile organic compound
 MSA = Mine Safety Administration

B-9. PERSONAL PROTECTIVE EQUIPMENT

Cold Test Pit South poses low to moderate potential hazards to all personnel from the ongoing construction, operation, and maintenance activities (Loomis et al. 1997). A description of the levels of personal protective equipment (PPE), upgrading and downgrading criteria, and PPE inspection criteria are specified in Section 9 of the main body of this document. Visitors to the site not requiring access into the exclusion zone will require at a minimum hard hats, safety glasses with side shields, and sturdy leather boots above the ankles. Table B-6 provides the OU 7-10 mockup tasks, PPE levels, and PPE upgrade contingencies.

Table B-6. Project task-based personal protective equipment requirements and modifications.

| Task | Level of Personal Protective Equipment | Category | Modifications and Comments |
|--|--|------------------------|--|
| | | Primary or Contingency | |
| All OU 7-10 Glovebox Excavator Method Project Activities | | | |
| <ul style="list-style-type: none">• Site preparation• Equipment mobilization and demobilization• Equipment operation and evaluation as part of mockup testing | Level D | Primary | Level D PPE as defined in Section 9.2 of the main body of this document. In addition, personnel entering the exclusion zone will wear safety-toed boots. Modifications for specific hand protection for material handling and sampling tasks will be defined by the HSO. |
| <ul style="list-style-type: none">• Excavation of simulated waste pit• Re-establishing the simulated waste and pit after excavation | Modified Level D | Upgrade contingency | Upgrading to modified Level D (protective clothing, Tyvek coveralls or equivalent) may be required if action levels are exceeded or contact with simulated waste material cannot be avoided (prolonged and extensive skin contact). |
| <ul style="list-style-type: none">• Inspection, sorting, sizing, and sampling of excavated materials• Material staging, removal, and site restoration.• Pit grouting | Level C | Upgrade contingency | If airborne contaminants increase to concentrations above established action limits, Level C full-face air-purifying respiratory protection will be worn in conjunction with chemical protective clothing (cartridge to be selected by project IH based on airborne hazard). |
| HSO = health and safety officer IH = industrial hygienist PPE = personal protective equipment | | | |

B-10. DECONTAMINATION PROCEDURES

The OU 7-10 mockup activities are being conducted at Cold Test Pit South over the ISG test pit (with simulated waste forms) with no hazardous or radiological constituents. Though some of the raw materials used in the simulated waste mixture could present a potential inhalation or skin hazard, the use of engineering and administrative controls should minimize personnel exposure. Therefore, hazardous or radiological decontamination is not required. If simulated waste materials are encountered at levels that present a contact or airborne release hazard to personnel, implementation of additional engineering controls, or some wetting or limited decontamination procedures, may be required to mitigate the potential hazards. In addition, equipment may be cleaned (i.e., decontaminated) at the end of the project using gross mechanical techniques, wiping, or steam cleaning, as required.

B-10.1 Contamination Control and Prevention

If contamination is encountered during OU 7-10 mockup activities, additional wetting or engineering controls will be used to mitigate contact or airborne hazards. Contamination control and prevention procedures will be implemented to minimize personnel contact with contaminated surfaces if such surfaces are encountered and contacted. The following contamination control and prevention measures will be employed if contamination is encountered:

- Identify potential sources of contamination and design containment, isolation, and engineering controls to eliminate or mitigate any potential for contact or release of contaminants
- Limit the number of personnel, equipment, and materials that enter the contaminated area
- Implement immediate decontamination procedures to prevent the spread of contamination (if contamination is found on the outer surfaces of equipment)
- Use only the established control entry and exit point from the contaminated area to minimize the potential for cross-contamination and expedite contamination control surveys
- Wear disposable outer garments and use disposable equipment (where possible).

B-10.2 Personnel and Equipment Decontamination

Decontamination procedures for personnel and equipment during OU 7-10 mockup activities are not anticipated to be required beyond normal PPE changeout and equipment cleaning, respectively. If waste contact cannot be avoided (e.g., excessive contact from prolonged periods that may cause skin irritation or drying or dermatitis), then additional engineering controls, in combination with PPE upgrades, may be necessary to control the contact hazard. Equipment will be decontaminated based on the source of contamination.

B-10.3 Modified Level D Personal Protective Equipment Doffing and Decontamination (If Required)

If required to be worn during OU 7-10 mockup activities, modified Level D (see Section 9 of the main body of this document) protective clothing (e.g., disposable coveralls) will be doffed following standard removal techniques (rolling outside surface inward and down) and will constitute the initial decontamination step. All PPE will be placed in the appropriately labeled containers. Cloth coveralls may be reused as long as they remain serviceable, according to an industrial hygienist and safety professional judgment call.

B-10.4 Level C Personal Protective Equipment Doffing and Decontamination (If Required)

If respiratory protection is worn during OU 7-10 mockup activities in conjunction with protective clothing (e.g., Level C PPE [see Section 9 of the main body of this document]), then the modified Level D sequence will be followed with one additional step. For that additional step (following protective clothing doffing), respirators will be removed and placed in a separate container.

B-10.5 Site Sanitation and Waste Minimization

During OU 7-10 mockup activities, site personnel will use the portable toilet facilities provided in the Cold Test Pit South or restroom facilities inside the RWMC area. Potable water and soap, or hand and face sanitary wipes, will be available within the administrative trailer or the RWMC facility for personnel to wash their hands and face upon exiting the work area.

Waste materials will not be allowed to accumulate at the project task sites. Appropriately labeled containers for industrial waste and CERCLA waste will be maintained at the project site. Personnel should make every attempt to minimize waste through the judicious use of consumable materials. All site personnel are expected to make good housekeeping a priority at the job site.

B-11. EMERGENCY RESPONSE PLAN FOR COLD TEST PIT SOUTH

Section 11 of the main body of this document defines the responsibilities of personnel working at the cold test pits (including Cold Test Pit South) and the INEEL Emergency Response Organization by providing an emergency response plan for guidance in responding to abnormal events during activities at the pits. Section 11 of the main body of this document is applicable to the OU 7-10 mockup activities and will be implemented as applicable.

B-11.1 NOTIFICATIONS

As directed by the office of the Secretary of Energy, the RWMC area director will be responsible for immediately notifying the DOE and local agencies off-Site of all significant abnormal events that occur at the cold test pits. This duty will be in addition to the notification requirements established in INEEL procedures for events that are categorized as emergencies or unusual occurrences. For this reason, the OU 7-10 mockup project operations technical lead will immediately report all abnormal events that occur on the site to the RWMC shift supervisor and to the WCC. The WCC will, in turn, notify the appropriate INEEL emergency response resources and other INEEL facilities. The RWMC shift supervisor and the WCC share the responsibility for notifying the RWMC facility manager, emergency coordinator, and area director, as appropriate. The operations technical lead may make additional notifications (as listed in Section B-1 1.2) at the discretion of the project supervision.

The emergency coordinator will be the single point of contact between the project and the INEEL ERO and off-Site people or agencies. The emergency coordinator will make all off-Site notifications. The OU 7-10 Mockup project notification responsibilities are listed in Table B-7.

Table B-7. OU 7-10 mockup project notification responsibilities.

| Responsible Person or Organization | | Phone | Pager | Radio |
|--|---|----------|-------|---------|
| Operations technical lead or any task-site personnel | INEEL emergency response telephone number | 777 | – | KOK 130 |
| Operations technical lead | Warning Communications Center | 526-1515 | – | KID 240 |
| Operations technical lead | INEEL spill notification team for spills | – | 6400 | – |
| Operations technical lead | RWMC shift supervisor | 526-2767 | 4428 | – |
| Operations technical lead | OU 7-10 facility manager | 526-1085 | 5076 | |
| OU 7-10 facility manager | WAG 7 manager of projects | 526-3029 | 6451 | – |
| WAG 7 manager of projects | ICP manager of projects | – | – | – |
| WAG 7 manager of projects | DOE-ID manager, ICP | – | – | – |
| WAG 7 manager of projects | ICP safety, health, and quality assurance manager | 526-9566 | 5689 | – |
| RWMC shift supervisor | RWMC site area director or landlord | 526-4223 | 5270 | – |

DOE-ID = U.S. Department of Energy Idaho Operations Office ICP = Idaho Completion Project
 INEEL = Idaho National Engineering and Environmental Laboratory
 RWMC = Radioactive Waste Management Complex WAG – waste area group

B-11.2 TELEPHONE AND RADIO CONTACT REFERENCE LIST

The points of contact for the OU 7-10 mockup project are listed in Table B-8. This list will be posted at the entrance to the project-specific control zones and in the general administrative and project-specific site offices for the cold test pits.

Table B-8. OU 7-10 mockup project emergency point-of-contact list.

| Contact Title | Contact Name | Phone Number or Radio Net | Pager Number |
|--|---------------------|-----------------------------------|--------------|
| Warning Communications Center | – | 777 or 526-1515 Radio: KID-240 | – |
| Radioactive Waste Management Complex (RWMC) shift supervisor | – | 526-2767 | – |
| RWMC nuclear facility operations | Albert E. Millhouse | 526-6932 | 5304 |
| RWMC site area director | David M. Bright | 526-4223 | 5270 |
| Operational medical program | – | 526-1596 | – |
| First aid (Central Facilities Area medical facility, CFA-1612) | – | 777, or 526-2356 | – |

Table B-8. (continued).

| Contact Title | Contact Name | Phone Number or Radio Net | Pager Number |
|---|----------------------|------------------------------|-----------------|
| Fire and security | — | 777 | — |
| Waste Area Group (WAG) 7 manager of projects | John M. Schaffer | 526-3029 | 645 1 |
| Waste Area Group (WAG) 7 OU 7-10 Project Facility Manager | Joseph E. Uptergrove | 526-0270 | 9072 |
| Waste Area Group (WAG) 7 OU 7-10 Shift Operations Manager | James W. Barker | 526-3432 | 7667 |
| ICP environmental compliance officer | Brent N. Burton | 526-8695 | 7486 |
| RWMC safety engineer | James F. O'Brien | 526-5 179 | 6447 |
| RWMC environment, safety, and health manager | Randy D. Sayer | 526-5706 | 5865 |
| RWMC radiological control engineer | Thayne C. Butikofer | 526-7873 | 3296 |
| RWMC industrial hygiene | Brian M. Perkes | 526-9358 | 6355 |
| RWMC emergency planner | Silas Versage | 526-5 130 | 63 12 |
| RWMC quality engineer | Brian Chesnovar | 526-1435 | 3326 |
| WAG 7 radiological control engineer | W. Rick Home | 526-53 18 | 5898 |
| WAG 7 industrial hygiene | Brian Perkes | 526-9358 | 6355 |
| WAG 7 safety engineer | Kelly A. Wooley | 526-2552 | 7368 |
| ICP cold test pit field team leader | &chard Jones | 526-1454 | 7914 |

B-12 REFERENCES

- 29 CFR 1910.120, 2002, Title 29, "Labor," Part 1910, "Occupational Safety and Health Administration," Subpart H, "Hazardous Materials," Section 1910.120, "Hazardous Waste Operations and Emergency Response," *Code of Federal Regulations*, Office of the Federal Register, February 8, 2002.
- 29 CFR 1926.65, 2002, Title 29, "Labor," Part 1926, "Safety and Health Regulations for Construction," Subpart D, "Occupational Health and Environmental Controls," Section 1926.65, "Hazardous Waste Operations and Emergency Response," *Code of Federal Regulations*, Office of the Federal Register, April 15, 2002.
- 42 USC § 9601 et seq., 1980, "Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA/Superfund)," *United States Code*, December 11, 1980.
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